United States Department of Agriculture

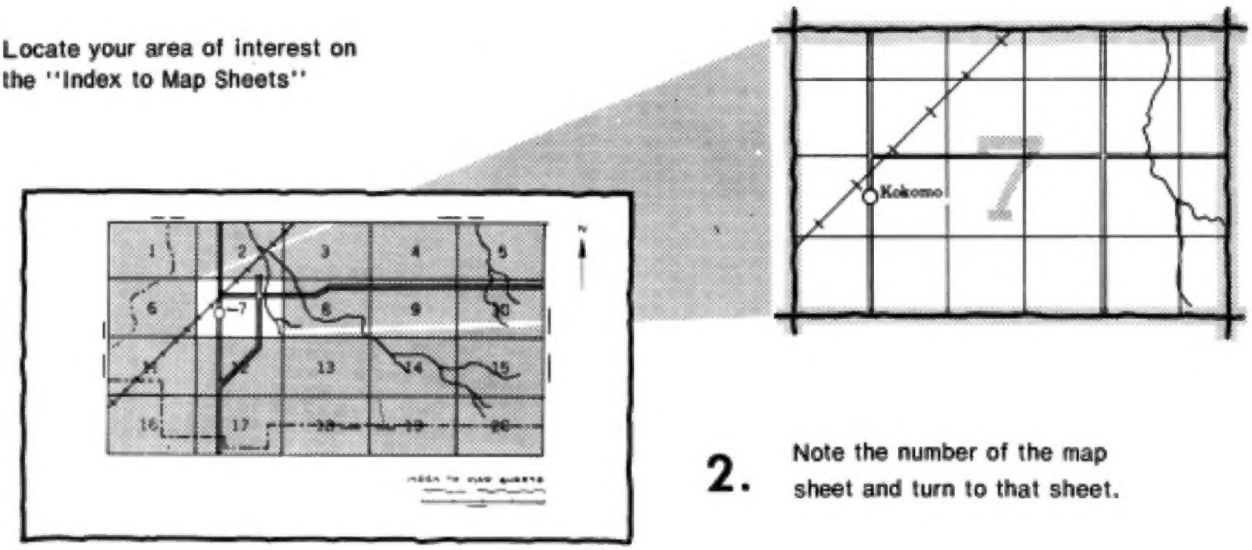
Soil Conservation Service

In Cooperation with Kentucky Agricultural Experiment Station and Kentucky Department for Natural Resources and Environmental Protection

Soil Survey of Jessamine and Woodford Counties, Kentucky

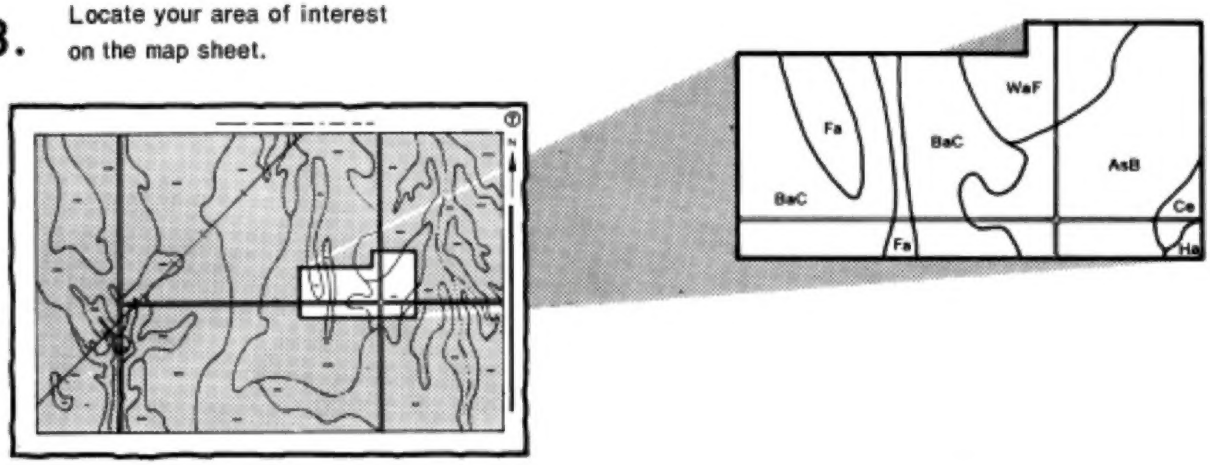
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

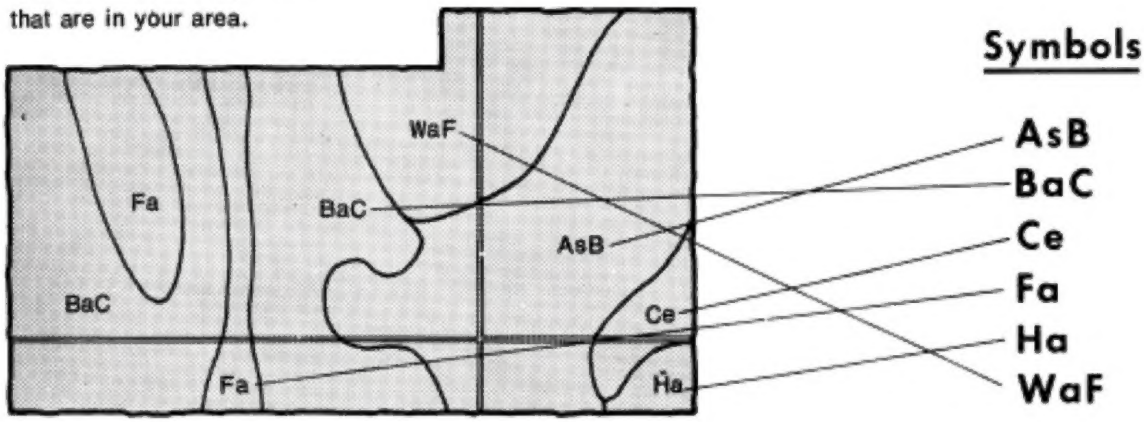


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

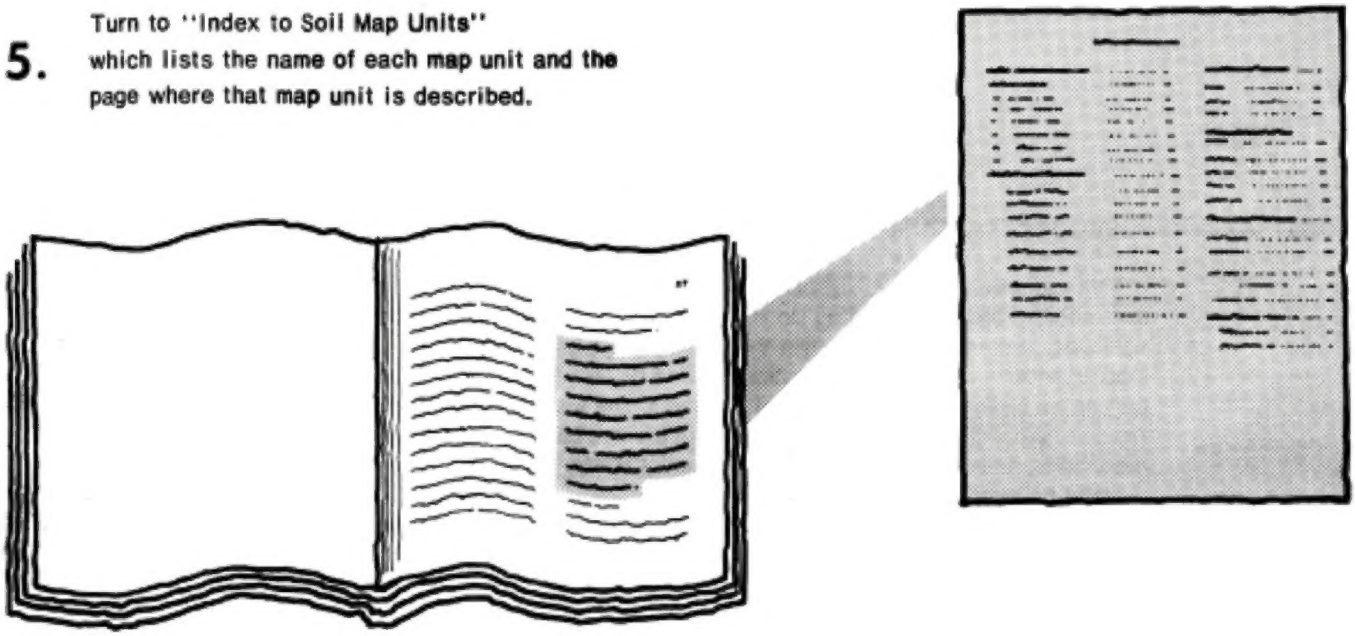


4. List the map unit symbols that are in your area.

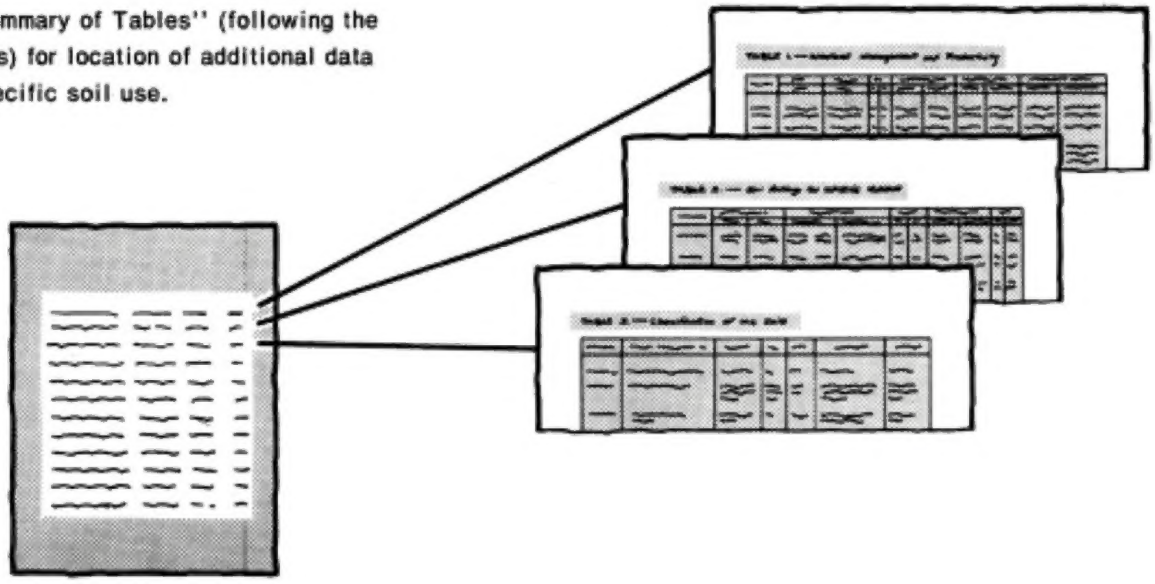


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1971 to 1976. Soil names and descriptions were approved in August, 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service, the Kentucky Agricultural Experiment Station, and the Kentucky Department for Natural Resources and Environmental Protection. It is part of the technical assistance furnished to the Soil and Water Conservation District of Jessamine and Woodford Counties.

Cover: Pasture of Kentucky bluegrass grazed by thoroughbred racehorses. The soil is Maury silt loam, 2 to 6 percent slopes.

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Issued December 1983

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Foreword

The Soil Survey of Jessamine and Woodford Counties contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

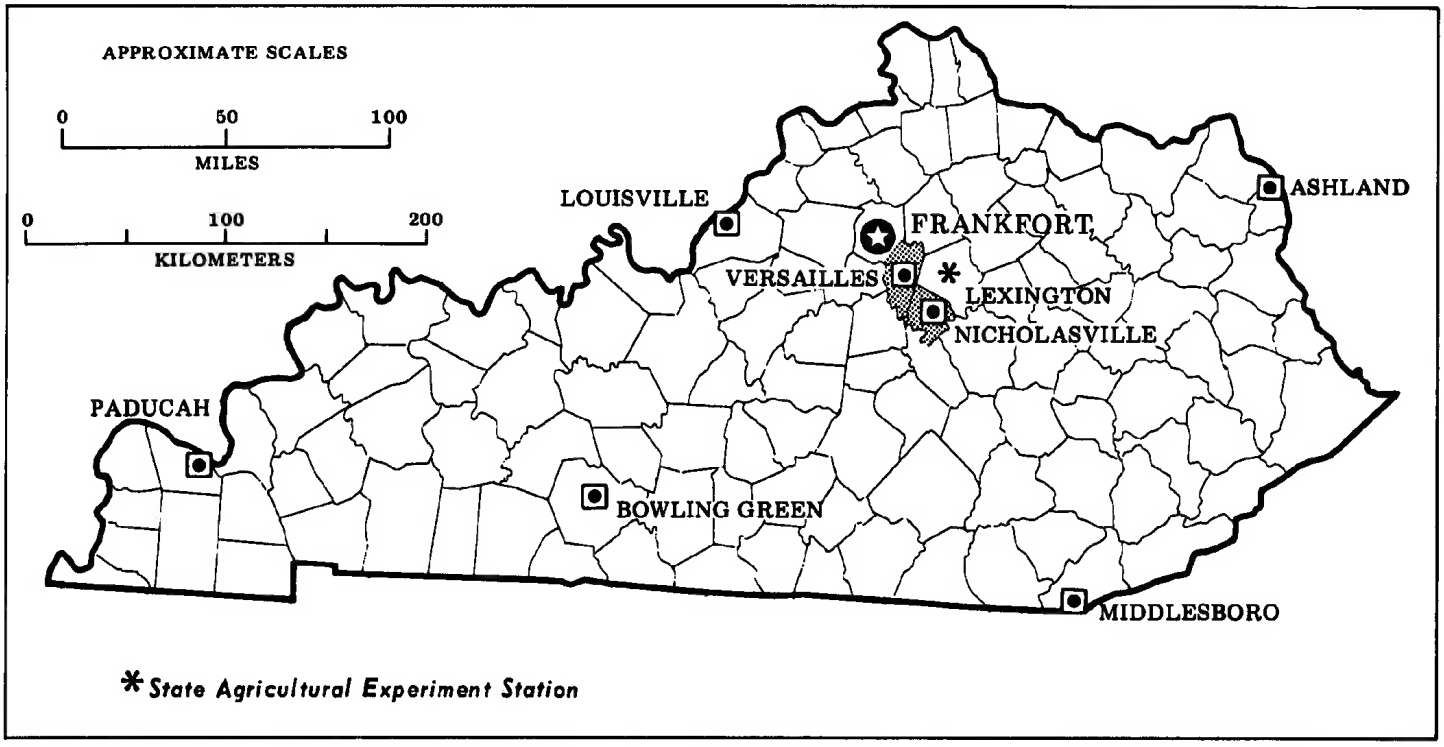
This soil survey has been prepared for many different users. Farmers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Glen E. Murray
State Conservationist
Soil Conservation Service



Location of Jessamine and Woodford Counties in Kentucky.

SOIL SURVEY OF JESSAMINE AND WOODFORD COUNTIES, KENTUCKY

By Herman P. McDonald, Raymond P. Sims, and Dan Isgrig, Soil Conservation Service, and Robert L. Blevins, Kentucky Agricultural Experiment Station

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Kentucky Agricultural Experiment Station and the Kentucky Department for Natural Resources and Environmental Protection

JESSAMINE AND WOODFORD COUNTIES are in the east-central part of Kentucky (see facing page). Jessamine County has an area of approximately 177 square miles, or 113,280 acres. Woodford County has an area of 194 square miles, or 123,520 acres.

Most of the two counties is in the gently rolling to undulating Inner Bluegrass physiographic region. This part of Kentucky is famous for bluegrass pasture and thoroughbred racehorses. A small area in the southeastern part of Jessamine County, in the hills of the Bluegrass physiographic region, is highly dissected by natural drainageways. The ridges are long and narrow, and the side slopes are fairly steep.

Agriculture has been important in both counties since they were first settled. Growing burley tobacco and raising cattle and horses are still important farm enterprises.

The climate is a temperate, humid, continental type. Winters are short and characterized by short cold spells, frequent sharp changes in temperature, and fairly high humidity. Summer is longer than winter, but hot periods are generally brief. Precipitation is usually well distributed throughout the year. Brief periods of drought occur in summer, and periods of excess moisture often occur in winter and spring.

Both counties are fairly similar in density of population, resources, and topography. Nicholasville, the county seat of Jessamine County, and Versailles, the county seat of Woodford County, are the major trade and population centers. Both towns have a number of small industries.

General nature of the area

The history, climate, physiography, relief, drainage, and farming in the survey area are briefly described in the paragraphs that follow.

History

Jessamine County, the 38th county established in Kentucky, was formed in 1798. Originally, it was the southern part of Fayette County. The name was derived from Jessamine Creek. Nicholasville, the county seat, was established in 1812.

Woodford County was formed in 1788. Versailles, the county seat, was established in 1792.

Both counties throughout their history have been mainly agricultural. More recently, the population of the two counties has increased rapidly, largely because of industrial and commercial growth and the expansion of educational facilities. Consequently, many of the smaller farms are now operated only on a part-time basis.

Climate

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Lexington for the period 1951 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 35 degrees F, and the average daily minimum temperature is 26 degrees. The lowest temperature on record, which occurred at Lexington on January 24, 1963, is -21 degrees. In summer the average temperature is 74 degrees, and the average daily maximum temperature is 85 degrees. The highest recorded temperature, which occurred on July 22, 1952, is 103 degrees.

Growing degree days, shown in table 1, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 24 inches, or 53 percent, usually falls in April through September, which in-

cludes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 3.89 inches at Lexington on June 23, 1960. Thunderstorms number about 47 each year, 25 of which occur in summer.

Average seasonal snowfall is 17 inches. The greatest snow depth at any one time during the period of record was 12 inches. On the average, 8 days have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The prevailing wind is from the south. Average windspeed is highest, 12 miles per hour, in March.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Physiography, relief, and drainage

Jessamine and Woodford Counties are mainly in the Inner Bluegrass physiographic region. A small area in the southeastern part of Jessamine County is in the hills of the Bluegrass physiographic region. The exposed rock in these areas is of Ordovician age (*8*).

The Inner Bluegrass physiographic region is underlain by limestone of the Cynthiana, Lexington, and High Bridge Formations. The Cynthiana Formation occurs mostly in the northwestern part of Woodford County and in the west-central and extreme northwestern parts of Jessamine County. It is mainly limestone but is interbedded with thin layers of calcareous shale. Lowell and Faywood soils overlie this formation. The High Bridge Formation is along the Kentucky River gorge. It is massive limestone, the oldest exposed rock in the State. The Lexington Formation underlies most of the Inner Bluegrass area. It is thin-bedded shaly limestone that is mostly phosphatic. Maury and McAfee soils, generally medium to high in phosphate, commonly occur over the Lexington Formation.

The hills of the Bluegrass physiographic area are underlain by calcareous shale, siltstone, and limestone of the Eden and Garrard Formations, the youngest exposed rock in the survey area. Eden and Culleoka soils commonly occur over these formations.

There are several fault systems. The Hickman fault, a major fault, follows Hickman Creek in the eastern part of the Jessamine County and extends northeast into Fayette County.

Most of the survey area is an old eroded peneplain. Slopes are mostly gentle or undulating. In steep areas, the exposed rocks are less resistant to weathering and streams have cut deep narrow valleys that have fairly long, steep, and sharp crested ridges. Limestone bluffs occur where short tributary streams flow through gorges to the Kentucky River.

All surface water in Jessamine and Woodford Counties eventually drains into the Kentucky River. In the eastern and central parts of Jessamine County, surface drainage is provided primarily by Hickman and Jessamine Creeks, which flow southward. In the western part of the county, surface drainage is provided by small streams that flow southwest into Woodford County. A small area in the northwestern part of Jessamine County is drained by small streams that flow northward. Surface drainage in the southern half of Woodford County is provided mainly by Griers Creek and Clear Creek. These streams flow in a southwesterly direction. Buck Run and Glenns Creek provide drainage in the northwestern part of the county, and a number of small streams that flow into Elkhorn Creek provide drainage in the northern part. Sinkholes, through which water passes into underground channels, are common. Sinking Creek in Jessamine County is drained in this manner.

Farming

Most of the area surveyed has been cleared of forest, and at present a large part is pasture. Bluegrass, which is not native in the area, has been an important pasture grass for many years. Burley tobacco is now the main cash crop. Corn, barley, and wheat are the main grain crops (fig. 1).

Most of the grain, pasture, and hay produced is utilized by livestock. Straw from small-grain crops is used on horse farms for bedding. Red clover grass mixtures, lespedeza, and alfalfa are the principal hay crops. Bluegrass, orchardgrass, and fescue in mixtures with clover, or bluegrass alone, are the main pasture plants (fig. 2).

The Bluegrass region is famous for high quality livestock, especially racehorses. There are several horse farms in both counties. The production of beef cattle is also significant. Dairy cattle, sheep, and hogs are produced in fewer numbers.

There are still several small scattered wooded areas throughout the two counties. The larger areas are along the river bluffs and on steeper land near the major creeks.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material,

which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures (*12*).

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil maps for broad land use planning

The general soil maps at the back of this publication show, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil maps provide a broad perspective of the soils and landscapes in the survey area. They provide a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of the small scale, the maps do not show the kind of soil at a specific site. Thus, they are not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

In the paragraphs that follow, the potential of each map unit is considered for *cultivated farm crops, specialty crops, woodland, urban uses,* and *recreation areas*. Cultivated farm crops are those grown extensively by farmers in the survey area. Specialty crops include vegetables, fruits, and nursery crops grown on limited acreage and generally requiring intensive management. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas include campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Extensive recreation areas include those used for nature study and as wilderness.

1. Maury-McAfee

Deep and moderately deep, well drained loamy soils on undulating to rolling uplands

This map unit occurs mainly in the central and northwestern parts of Jessamine County but is also extensive in the northern half of Woodford County. It consists of broad gently sloping ridges and somewhat steeper slopes along drainageways and around sinks (fig. 3). Irregular topography, including sinks, is fairly common.

This unit makes up about 38 percent of Jessamine County and 40 percent of Woodford County. In Jessamine County it is approximately 43 percent Maury soils, 35 percent McAfee soils, and 22 percent minor soils. In Woodford County it is about 65 percent Maury soils, 20 percent McAfee soils, and 15 percent minor soils.

Maury soils occur mainly on broad ridgetops and in places on the smoother side slopes. They are deep, well drained, and fertile. McAfee soils generally occur on narrow ridgetops, on the steeper slopes, along drainageways, and around areas of karst topography. They are moderately deep, well drained, and fertile. All have a silt loam surface layer and a clayey subsoil.

Minor in this unit are Lowell, Faywood, and Fairmount soils on the uplands, Donerail along foot slopes, and Huntington, Ashton, and Dunning on the flood plains.

Most of the unit has been cleared and is used extensively for cultivated crops, hay, and pasture. The chief crops are burley tobacco and Kentucky bluegrass for pasture and hay. Some small grain is grown and some corn

for grain and silage. Thoroughbred racehorses, beef cattle, and burley tobacco are the major farm enterprises.

This unit has high potential for cultivated farm crops, some speciality crops, woodland, urban use, and intensive recreation facilities. The hazard of erosion is severe on the steeper slopes in cultivated areas. In places, the moderate depth to bedrock is a limitation to deep-rooted crops and to some urban and recreation use. Urban development is severely limited on some of the minor soils because of the flood hazard. Additional drainage is needed in a few areas on the flood plain.

2. McAfee-Maury-Fairmount

Deep to shallow, well drained loamy and clayey soils on rolling to hilly uplands

This map unit occurs mainly in the eastern and western parts of Jessamine County and in the southern and western parts of Woodford County. It consists of rolling uplands and moderately steep slopes along the major drainageways (fig. 4). Karst topography and sinkholes are common.

This unit makes up about 40 percent of Jessamine County and approximately 50 percent of Woodford County. In Jessamine County, it is about 45 percent McAfee soils, 15 percent Maury soils, 15 percent Fairmount soils, and 25 percent minor soils. In Woodford County, it is approximately 27 percent McAfee soils, 25 percent Maury soils, 10 percent Fairmount soils, and 38 percent minor soils.

McAfee soils occupy fairly narrow ridgetops and sloping and moderately steep areas along drainageways. They are moderately deep, well drained, and fertile. Rock crops out in a few places. Maury soils occur largely on the broader ridgetops, but they also occur along the smoother side slopes. They are deep, well drained, and fertile. Both the McAfee and Maury soils have a silt loam surface layer and a clayey subsoil. Fairmount soils occur mostly on steeper slopes along drainageways and less extensively on narrow ridgetops. They are shallow, excessively drained soils with many rock outcrops and slabs of limestone. They have a silty clay surface layer and a clayey subsoil.

Minor in this unit are Lowell and Faywood soils on the uplands and Ashton and Huntington on the flood plains.

This map unit is used extensively for cultivated crops, hay, and pasture. The chief crops are burley tobacco and Kentucky bluegrass for pasture and hay. Some small grain is grown and some corn for grain and silage. Some of the steeper areas are still wooded. Burley tobacco and beef cattle are the major farm enterprises.

This unit has medium potential for cultivated farm crops, speciality crops, woodland, urban use, and recreation facilities. On the steeper cultivated slopes, the hazard of erosion is severe. Crop production is limited in many places by the shallow to moderate depth of the soil over bedrock. Urban use and facilities for intensive recreation are severely limited in many places because of the slope and the depth of the soil over rock. Additional drainage is needed in a few small areas on the flood plain.

3. Fairmount-Rock outcrop

Shallow, well drained clayey soils and limestone outcrop on the Kentucky River bluffs

This map unit extends along the Kentucky River in the southern part of Jessamine and Woodford Counties. It consists predominantly of long, very steep slopes, massive limestone outcrops, or palisades (fig. 5), and narrow ridgetops.

This unit makes up about 10 percent of each county. In Woodford County, it is about 30 percent Fairmount soils, 21 percent Rock outcrop, and 49 percent minor soils. In Jessamine County, it is approximately 40 percent Fairmount soils, 20 percent Rock outcrop, and 40 percent minor soils (fig. 6).

Fairmount soils occur mainly on steep slopes. They are shallow soils with numerous flagstones and limestone ledges. They have a silty clay surface layer and a clayey subsoil. The Rock outcrop in this unit is dominantly massive exposures on steep slopes.

Minor in this unit are McAfee and Faywood soils on narrow ridgetops and upper slopes and the Elk and Huntington soils on flood plains.

Nearly half the unit is in low grade hardwoods, redcedar, and brush. Most of the cleared acreage is used for hay, pasture, tobacco, and corn.

This map unit has low potential for cultivated farm crops and speciality crops. The potential for woodland, urban use, and intensive recreation facilities is also low. The erosion hazard is very severe in most cultivated areas and on slopes that lack plant cover. The Rock outcrop, the shallowness of the soil over bedrock, and steep slopes are severe limitations in much of this unit to farm and nonfarm use. The hazard of flooding is a limitation to urban use and intensive recreation facilities on some of the minor soils.

4. Eden-Culleoka

Moderately deep, well drained, somewhat droughty loamy and clayey soils on hilly to steep uplands

This map unit occurs only in the southeastern part of Jessamine County. It consists of long narrow ridgetops and steep hillsides (fig. 7).

This unit occupies about 12 percent of Jessamine County. It is about 45 percent Eden soils, 28 percent Culleoka soils, and 27 percent minor soils.

Eden soils occur extensively on steep hillsides below Culleoka soils. They are less extensive on narrow sloping ridgetops. They are moderately deep, well drained, and somewhat droughty. They have a surface layer of silty clay loam or silty clay and a clayey subsoil. Fertility is moderate. Culleoka soils occur mostly on ridgetops and on upper slopes above Eden soils. They are moderately

deep and well drained. They have a silt loam surface layer and a loamy subsoil. Fertility is moderate.

Minor in this unit are Lowell and Faywood soils on the uplands and Huntington and Boonesboro soils on the narrow flood plains.

About 60 percent of this unit has been cleared, and about 40 percent is in low grade hardwoods, redcedar, and brush.

In some of the less steep areas, most of the cleared acreage is used for pasture, hay, and cultivated crops. The main farm enterprises are burley tobacco and beef cattle.

This map unit has medium potential for cultivated farm crops and for woodland. It has low potential for urban use, intensive recreational use, and specialty crops. The hazard of erosion is generally severe, especially in many cultivated areas and most nonvegetated areas. Steep slopes and the moderate depth of soil over bedrock are limitations on a large part of this unit to the production of crops or to the use of the soils for urban or intensive recreation purposes.

Broad land use considerations

Each year a considerable acreage is developed for urban use. Deciding what land should be used for this purpose is important in this survey area. In general, the soils that have high potential for cultivated crops also have high potential for urban development.

The general soil maps at the back of this publication can help in planning the general outline of urban areas, but they cannot be used in selecting sites for specific urban structures. Data on specific soils is needed. Such data can be helpful in planning future land use patterns.

Areas where the soils are so unfavorable that urban development is almost prohibitive are not extensive in the survey area. In many areas of the McAfee-Fairmount-Maury and the Fairmount-Rock outcrop map units, however, limitations are severe because the soils are shallow over bedrock and in many places they are steep. Many parts of the Eden-Culleoka unit have steep slopes and clayey soils on which urban development would be costly. There are also areas on the flood plain where flooding and ponding are severe limitations.

In large areas of the county are soils that can be developed for urban use at lower costs than those mentioned in the preceding paragraph. These soils are in many parts of the Maury-McAfee unit and in some parts of the McAfee-Fairmount-Maury unit. They are excellent farmland. This potential should not be overlooked when broad land uses are considered. In both of these units are soils that are only 20 to 40 inches deep over bedrock, but the rolling landscape and good soil drainage are qualities favorable for nonfarm uses.

The hilly Eden-Culleoka unit and the deeply dissected terrain of the Fairmount-Rock outcrop unit have potential as recreation areas. The forest cover, the streams, and in places the rugged nature of the landscape have esthetic value.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. The McAfee series, for example, was named for the town of McAfee in Mercer County.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Maury silt loam, 2 to 6 percent slopes is one of several phases within the Maury series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes, soil associations, and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. McAfee-Rock outcrop complex is an example.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could

significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Rock outcrop is an example. It is named in complex units. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

AsA—Ashton silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on stream terraces and in upland depressions. It is rarely flooded. Individual areas are long and narrow, 200 to 400 feet wide, and range from 5 to 25 acres.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsoil extends to a depth of 40 inches. It is brown silt loam to 22 inches and brown heavy silt loam below. The substratum to 60 inches or more is dark yellowish brown silt loam.

Included with this soil in mapping are small areas of Huntington soils. Included soils make up 4 to 8 percent of this map unit, but separate areas are generally less than 2 acres.

This soil is high in natural fertility and has moderate organic-matter content. It is neutral to medium acid throughout the profile. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep.

Most of the acreage is used for cultivated crops, hay, and pasture. A few small areas are used as homesites.

This soil has high potential for row crops, hay, and pasture. Very high yields can be obtained. Good tilth can be easily maintained by returning crop residue. Erosion is only slight in cultivated areas. In places, diversions are needed to intercept the runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitation is slight.

Because most areas are subject to flooding, the potential is low for urban use. The few areas that are not subject to flooding have only slight limitations for most urban use.

Capability class I; woodland group 1o.

AsB—Ashton silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on stream terraces, along foot slopes, and in upland depressions. It is rarely flooded. Individual areas are long and narrow, are 150 to 300 feet wide, and range from 5 to 30 acres.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsoil extends to a depth of 40 inches. It is brown silt loam to 22 inches and brown heavy silt loam below. The substratum to 60 inches or more is dark yellowish brown silt loam.

Included with this soil in mapping are small areas of Huntington, Elk, and Maury soils. Included soils make up 5 to 10 percent of the map unit, but separate areas are generally less than 2 acres.

This soil is high in natural fertility and moderate in organic-matter content. It is neutral to medium acid throughout the profile. It has good tilth and can be worked satisfactorily throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep.

Most of the acreage is used for cultivated crops, hay, and pasture. A small acreage is used for homesites and subdivisions.

This soil has a high potential for row crops, hay, small grain, and pasture. Burley tobacco is commonly grown.

Good tilth can be easily maintained by returning crop residue. Erosion is a moderate hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion. Diversions can be used to intercept runoff from higher adjacent areas and divert it into grassed waterways.

It has a high potential for woodland. Limitations are only slight.

Because most areas are subject to flooding, the potential is low for urban use. The few areas that are not subject to flooding have only slight limitations for most urban use.

Capability subclass IIe; woodland group 1o.

Bn—Boonesboro silt loam. This moderately deep, well drained, nearly level soil occurs mainly on flood plains along the small streams throughout the survey area. It is commonly flooded, particularly in winter and early in spring. Individual areas are usually long narrow bands, 150 to 300 feet wide, that range from 5 to 30 acres.

Typically, the surface layer is dark brown silt loam about 21 inches thick. The subsoil extends to a depth of 28 inches. It is brown gravelly silt loam. Limestone is at 28 inches.

Included with this soil in mapping are small areas of Huntington and Lindside soils. Included soils make up 5 to 10 percent of this map unit, but separate areas are generally less than 2 acres.

This soil is high in natural fertility and has moderate organic-matter content. It is slightly acid to mildly alkaline throughout the profile. It is slightly droughty during prolonged dry periods. It has good tilth and can be worked throughout a wide range of moisture content. It is moderately deep over bedrock. Permeability is moderate. Available water capacity is only moderate because of the gravelly subsoil. The root zone is moderately deep.

Most of the acreage is used for cultivated crops. Moderately high yields can be expected under good management.

The potential for row crops, hay, and pasture is high. Good tilth can be maintained by returning crop residue. In places, diversions are needed to intercept runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitation is slight.

This soil has low potential for most urban use because it is commonly subject to flooding and is only moderately deep over bedrock. In places these limitations can be partly overcome by good design and careful installation.

Capability subclass IIs; woodland group 1o.

CcC—Culleoka silt loam, 6 to 12 percent slopes. This moderately deep, well drained, sloping soil occurs on convex ridgetops. Areas are generally long and narrow, 200 to 400 feet wide, and range from 4 to 10 acres.

Typically, the surface layer is dark yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of 38 inches. It is yellowish brown silt loam and silty clay loam to 24 inches and yellowish brown flaggy silty clay loam below. Rippable siltstone is at 38 inches.

Included with this soil in mapping are small areas of Faywood and Lowell soils, a few small areas of Culleoka soils of less than 6 percent slopes, and a few areas of Culleoka flaggy silt loam. Included soils make up 5 to 10 percent of the map unit, but separate areas are less than 3 acres.

This soil is medium in natural fertility and moderate in content of organic matter. Unless limed, it is medium to strongly acid in the surface layer and subsoil and slightly to strongly acid in the substratum. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderately rapid, and the available water capacity is moderate. The root zone is moderately deep.

Most of the acreage is used for cultivated crops, hay, and pasture.

This soil has medium potential for row crops, hay, and pasture. Moderate yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. Erosion is a severe hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitation is slight.

This soil has medium potential for most urban use. Depth to rock and the slope are the major limitations.

Capability subclass IIIe; woodland group 2o

CcD—Culleoka silt loam, 12 to 20 percent slopes. This is a moderately deep, well drained, moderately steep soil on upper hillsides and around drainageways. Individual areas are 300 to 400 feet wide and range from 5 to 30 acres. Siltstone flagstones cover 5 to 15 percent of the surface.

Typically the surface layer is dark yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of 38 inches. It is yellowish brown flaggy silt loam to 24 inches and yellowish brown flaggy silty clay loam below. Rippable siltstone is at 38 inches.

Included with this soil in mapping are small areas of Faywood and Eden soils. Included areas make up 5 to 15 percent of the map unit, but individual areas are less than 4 acres

This soil is medium in natural fertility and moderate in organic-matter content. Unless limed, it is medium to strongly acid in the surface layer and subsoil and slightly to strongly acid in the substratum. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderately rapid, and the available water capacity is moderate. The root zone is moderately deep.

Most of the acreage is used for hay and pasture.

This soil has only low potential for row crops and medium potential for hay and pasture, but moderate yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. Erosion is a very severe hazard if row crops are grown. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitation is moderate.

This soil has low potential for most urban use. Slope is the major limitation.

Capability subclass IVe; woodland group 2r.

CfE—Culleoka flaggy silt loam, 20 to 30 percent slopes. This is a moderately deep, well drained, steep soil on upper hillsides. It occurs as long bands, 400 to 800 feet wide, that range from about 10 to 70 acres. Siltstone flagstones cover from 15 to 35 percent of the surface.

Typically the surface layer is dark yellowish brown flaggy silt loam about 5 inches thick. The subsoil extends to a depth of 38 inches. It is yellowish brown flaggy silt loam to 24 inches and yellowish brown flaggy silty clay loam below. Rippable siltstone is at 38 inches.

Included with this soil in mapping are small areas of Faywood, Fairmount, and Eden soils. Included areas make up 5 to 20 percent of the map unit, but individual areas are less than 5 acres.

This soil is medium in natural fertility and moderate in organic-matter content. Unless limed, it is medium to strongly acid in the surface layer and subsoil and slightly to strongly acid in the substratum. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderately rapid, and the available water capacity is moderate. The root zone is moderately deep.

Most of the acreage is used for pasture. A small acreage is still woodland.

This soil has low potential for row crops. It has medium potential for pasture and hay, and moderate yields can be obtained under good management. Flagstones and steep

slopes limit the use of machinery. Minimum tillage and a good cover of grasses and legumes reduce runoff and help to control erosion.

This soil has high potential for woodland. Equipment limitations are only moderate.

The potential is low for urban use because of steep slopes.

Capability subclass VIe; woodland group 2r.

DoB—Donerail silt loam, 2 to 6 percent slopes. This deep, moderately well drained, gently sloping soil occurs on foot slopes and on broad ridges throughout most of the survey area. Individual areas are irregularly shaped and range from 3 to 15 acres.

Typically, the surface layer is dark brown silt loam about 11 inches thick. The subsoil extends to a depth of 35 inches. It is dark yellowish brown silty clay loam to 17 inches and dark yellowish brown silty clay to 29 inches. The silty clay is sticky and plastic when wet. Below 29 inches it is yellowish brown clay that is sticky and plastic when wet. The substratum to a depth of 60 inches or more is yellowish brown clay that is sticky and plastic when wet.

Included with this soil in mapping are small areas of Lowell and Maury soils. Also included are small eroded spots with a silty clay loam surface layer. Included soils make up 5 to 10 percent of the map unit, but separate areas generally are less than 3 acres.

This soil is high in natural fertility and moderate in organic-matter content. Unless limed, it generally ranges from slightly acid to very strongly acid in the surface layer and subsoil and from medium acid to mildly alkaline in the substratum. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is high. The root zone is only moderately deep because of restricted internal drainage and the clayey subsoil. A seasonal high water table rises to 1 1/2 to 3 feet of the surface during wet periods. The shrink-swell potential is moderate.

Most of the acreage is used for row crops, hay, and pasture. A small acreage is in subdivisions.

This soil has high potential for row crops and small grain. High yields can be obtained under good management. The potential is also high for hay and pasture. Burley tobacco does not do well in wet years, and alfalfa usually thins out after 2 or 3 years as a result of wetness. Good tilth can be easily maintained by returning crop residue. Erosion is a moderate hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitation is only slight.

This soil has low potential for most urban use because of low strength, moderate shrink-swell, wetness, and a clayey subsoil. Some of these limitations can be partially overcome by good design and careful installation. The moderate to slow permeability of the clayey subsoil limits the use of the soil as a septic tank absorption field.

Capability subclass IIe; woodland group 2o.

Du—Dunning silty clay loam. This deep, very poorly drained, nearly level soil occurs on flood plains throughout most of the survey area. It is commonly flooded. Individual areas usually occur as long narrow bands, 200 to 300 feet wide, that range from 3 to 15 acres.

Typically, the surface layer is very dark gray silty clay loam about 16 inches thick. The subsoil extends to a depth of 34 inches. It is dark gray, mottled silty clay. Mottling increases with increasing depth. The substratum to a depth of 60 inches or more is gray silty clay mottled in shades of brown and gray.

Included with this soil in mapping are small areas of Melvin and Newark soils. Included soils make up 3 to 12 percent of this map unit, but separate areas are generally less than 2 acres.

This soil is high in natural fertility and organic-matter content. It ranges from medium acid to mildly alkaline throughout the profile. Permeability is slow, and the available water capacity is high. Tillage is somewhat difficult because of the high clay content of the surface layer and a seasonal high water table at or near the surface. The water table restricts the root zone. The shrink-swell potential is moderate.

Most areas are used for row crops, hay, and pasture.

This soil is suited to tile drainage. If drained, it has medium potential for most commonly grown row crops, hay, and pasture plants. Alfalfa and tobacco can be damaged during wet periods. In artificially drained areas, fairly good tilth can be easily maintained by returning crop residue. This soil is subject to flooding, especially in winter and early in spring. In places, diversions are needed to intercept runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitation is severe.

This soil has low potential for most urban use. Wetness, moderate shrink-swell potential, and the hazard of flooding are the chief limitations.

Capability subclass IIIw; woodland group 1w.

EdC—Eden silty clay loam, 6 to 12 percent slopes. This moderately deep, well drained, sloping soil occurs on long narrow ridgetops. Individual areas are about 200 to 300 feet wide and range from 5 to 30 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsoil extends to a depth of 30 inches. It is light olive brown flaggy silty clay that is mottled below about 18 inches. Weathered interbedded shale and siltstone and thin layers of fractured limestone are below 30 inches.

Included with this soil in mapping are small areas of Faywood and Fairmount soils and a few areas of severely eroded soils. Included soils make up 10 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and low in content of organic matter. It ranges from strongly acid to moderately alkaline throughout the profile. The low organic matter content and the high clay content in the surface layer make tillage somewhat difficult. Permeability is slow, and the available water capacity is moderate. The root zone is moderately deep, but the clayey subsoil restricts roots. Depth to bedrock is 20 to 40 inches. The shrink-swell potential is moderate.

Most of the acreage is used for pasture. A few areas are used for cultivated crops.

The potential is low for cultivated crops. It is medium for hay and pasture, and under good management moderate yields can be obtained. Fair tilth can be maintained by returning crop residue. Erosion is a very severe hazard in cultivated areas. Minimum tillage and the use of drought-resistant plants reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitation is moderate.

This soil has low potential for most urban use. Depth to rock, slow permeability, high clay content, and low strength are the chief limitations. Some of these limitations can be overcome to some extent by good planning and proper installation. The depth to rock and the slow permeability limit the use of this soil as a septic tank absorption field.

Capability subclass IVe; woodland group 3c.

EdD—Eden silty clay loam, 12 to 20 percent slopes. This moderately deep, moderately steep, well drained soil occurs on ridgetops and upper hillsides. Individual areas are generally 200 to 600 feet wide and range from 10 to 40 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsoil extends to a depth of 30 inches. It is light olive brown flaggy silty clay. Mottling occurs below about 18 inches. Below 30 inches is weathered interbedded shale and siltstone and thin layers of fractured limestone.

Included with this soil in mapping are small areas of Faywood, Fairmount, and Culleoka soils and a few areas of severely eroded soils. Included soils make up 10 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and low in content of organic matter. It ranges from strongly acid to moderately alkaline throughout the profile. Permeability is slow, and the available water capacity is low. Slope and the high clay content in the surface layer make tillage difficult. The root zone is moderately deep but the clayey subsoil restricts roots. Depth to bedrock is 20 to 40 inches. The shrink-swell potential is moderate.

Most of the acreage is used for pasture and hay (fig. 8). Some areas are brushy and are reverting to woods.

The potential for pasture and hay is medium. Because of slope and a very severe erosion hazard, the potential for row crops is low. Moderate yields of hay and pasture can be obtained under good management. A good ground cover of grasses and legumes that withstand moderate droughtiness reduces runoff and helps to control erosion.

The potential for woodland is medium. Equipment limitations are severe.

The potential is low for most urban use because of the depth to rock and the slope, slow permeability, high clay content, and low strength. Some of these limitations can be overcome to some extent by good management and proper installation. The depth to rock, the slope, and the slow permeability limit the use of this soil as a septic tank absorption field.

Capability subclass VIe; woodland group 3c.

EfE—Eden flaggy silty clay, 20 to 30 percent slopes. This moderately deep, steep, well drained soil occurs extensively on hillsides in the southeastern part of Jessamine County. Individual areas generally occur as bands that are 200 to 600 feet wide and range from 15 to 50 acres.

Typically, the surface layer is dark grayish brown flaggy silty clay about 5 inches thick. The subsoil extends to a depth of 30 inches. It is light olive brown flaggy silty clay. Mottling occurs below about 18 inches. Below 30 inches is weathered interbedded shale and siltstone and thin layers of fractured limestone.

Included with this soil in mapping are small areas of Faywood, Culleoka, and Fairmount soils and a few areas of severely eroded soils. Included soils make up 10 to 20 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and low in content of organic matter. It ranges from strongly acid to moderately alkaline throughout the profile. Permeability is slow, and the available water capacity is low. The root zone is moderately deep, but the clayey material restricts roots. Depth to bedrock is 20 to 40 inches. The shrink-swell potential is moderate.

Some areas are used for pasture. Many are brushy and are reverting to woods.

The potential for row crops is low. The potential for pasture is medium, and moderate yields can be obtained under good management. The hazard of erosion is too severe for cultivated crops. Steep slopes and flagstones limit the use of farm machinery. A good ground cover of grasses and legumes that withstand moderate droughtiness reduces runoff and helps to control erosion.

The potential for woodland is medium. The equipment limitation is severe.

The potential is low for most urban use. The slope, depth to rock, high clay content, and low strength are the chief limitations.

Capability subclass VIe; woodland group 3c.

EfF—Eden flaggy silty clay, 30 to 50 percent slopes. This moderately deep, very steep, well drained soil occurs extensively on hillsides in the southeastern part of Jessamine County. Individual areas are generally 300 to 600 feet wide and range from 25 to 100 acres.

Typically, the surface layer is dark grayish brown flaggy silty clay about 5 inches thick. The subsoil extends to a depth of 30 inches. It is light olive brown flaggy silty clay. Mottling occurs below about 18 inches. Below 30 inches is weathered interbedded shale and siltstone and thin layers of fractured limestone.

Included with this soil in mapping are small areas of Faywood, Fairmount, and Culleoka soils and a few areas of severely eroded soils. Included soils make up 10 to 20 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and low in content of organic matter. It ranges from strongly acid to moderately alkaline throughout the profile. Permeability is slow, and the available water capacity is low. The root zone is moderately deep, but the clayey subsoil restricts roots. Depth to bedrock is 20 to 40 inches. The shrink-swell potential is moderate.

Few areas are used for pasture. Many are brushy and are reverting to woods. Only a small acreage is woodland that is of commercial value.

The potential is low for row crops, hay, and pasture. In some areas low to moderate yields can be obtained under good management. The hazard of erosion is too severe for cultivated crops. Steep slopes and flagstones limit the use of farm machinery. A good ground cover of trees or drought-resistant plants reduces runoff and helps to control erosion.

The potential for woodland is medium. The equipment limitation is severe.

The potential is low for urban use. The slope, depth to rock, high clay content, and low strength are limitations.

Capability subclass VIIe; woodland group 3c.

EIB—Elk silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on stream terraces, chiefly along the Kentucky River but also along a few of the smaller streams. It is rarely flooded. Individual areas are irregularly shaped and range from 2 to 20 acres.

Typically, this soil has a brown silt loam surface layer about 8 inches thick. The subsoil extends to a depth of 48 inches. It is dark brown heavy silt loam to 18 inches and strong brown light silty clay loam below. The substratum to a depth of 60 inches or more is yellowish brown light silty clay loam.

Included with this soil in mapping are small areas of Ashton soils, a few small areas of moderately well drained silty soils, and a few small areas of sandy soils. Included soils make up 5 to 10 percent of the map unit, but separate areas generally are less than 2 acres.

This soil is high in natural fertility and moderate in organic-matter content. Unless limed, it ranges from medium acid to very strongly acid in the surface layer and subsoil and from slightly acid to very strongly acid in the substratum. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots.

Most of the acreage is used for row crops or hay.

This soil has a high potential for row crops, pasture, and small grain. Very high yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. Erosion is only a moderate hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitation is slight.

Most areas are subject to flooding and have low potential for urban use. The few areas that are not subject to flooding have no severe limitations for urban use.

Capability subclass IIe; woodland group 2o.

EIC—Elk silt loam, 6 to 12 percent slopes. This deep, well drained, sloping soil is on stream terraces, chiefly along the Kentucky River but also along a few of the smaller streams. It is rarely flooded. Individual areas are irregular in shape and range from 3 to 15 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil extends to a depth of 48 inches. It is dark brown heavy silt loam to 18 inches and strong brown light silty clay loam below. The substratum to a depth of 60 inches or more is yellowish brown light silty clay loam.

Included with this soil in mapping are few small areas of sandy soils. Included soils make up 5 to 10 percent of the map unit, but separate areas are generally less than 2 acres.

This soil is high in natural fertility and moderate in organic-matter content. Unless limed, it ranges from medium to very strongly acid throughout the profile. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots.

Most of the acreage is used for row crops, hay, or pasture.

This soil has medium potential for row crops, hay, and pasture. Moderately high yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. Erosion is a severe hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitation is slight.

Because most areas are subject to flooding, the potential is low for urban use. In the few areas that are not subject to flooding, slope and low strength are limitations.

Capability subclass IIIe; woodland group 2o.

EID—Elk silt loam, 12 to 20 percent slopes. This deep, well drained, moderately steep soil is on alluvial breaks and escarpments along the Kentucky River. It is rarely flooded. Individual areas are irregularly shaped and range from 2 to 10 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil extends to a depth of 48 inches. It is dark brown heavy silt loam to 18 inches and strong brown light silty clay loam below. The substratum to a depth of 60 inches or more is yellowish brown light silty clay loam.

Included with this soil in mapping are a few small areas of McAfee and Culleoka soils and a few small areas of sandy soils. Included soils make up from 10 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is high in natural fertility and moderate in organic-matter content. Unless limed, it ranges from medium to very strongly acid throughout the profile. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots.

Most of the acreage is used for hay, pasture, and row crops.

The soil has low potential for row crops. It has medium potential for hay and pasture, and moderate yields can be obtained under good management. Good tilth can be easily maintained. The erosion hazard is very severe in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

The potential for woodland is high. The equipment limitation is moderate.

The potential is low for most urban use. Steep slopes and the hazard of flooding are the chief limitations.

Capability subclass IVe; woodland group 2r.

EvB—Elk Variant silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on broad undulating ridgetops, mainly along the Kentucky River. Individual areas are irregularly shaped and range from 2 to 15 acres.

Typically, this soil has a brown silt loam surface layer about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is brown silt loam to 18 inches, brown light silty clay loam to 48 inches, and brown silty clay below.

Included with this soil in mapping are small areas of Maury soils and a few small areas of gravelly soils. Included soils make up 10 to 12 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is high in natural fertility and moderate in content of organic matter. Unless limed, it ranges from medium acid to strongly acid throughout the profile. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots.

Most of the acreage is used for row crops and hay.

The potential is high for row crops, hay, and small grain. Alfalfa and burley tobacco grow well. Very high yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. The erosion hazard is moderate in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

The potential for woodland is high. The equipment limitation is slight.

This soil has high potential for most urban use. It has no severe limitations.

Capability subclass IIe; woodland group 2o.

FaC—Fairmount flaggy silty clay, 6 to 12 percent slopes. This shallow, well drained, sloping soil occurs on narrow ridgetops and around the heads of drainageways, particularly in the southern half of the survey area. Individual areas are irregularly shaped and range from 2 to 15 acres. Limestone flagstones cover 10 to 30 percent of the surface.

Typically, the surface layer is dark brown flaggy silty clay about 11 inches thick. The subsoil extends to a depth of 17 inches. It is brown flaggy clay. Below 17 inches is hard limestone.

Included with this soil in mapping are a few areas of Faywood soils, a few areas of soils that are similar to Fairmount soils but have no coarse fragments, a few areas of Fairmount soils of less than 6 percent slopes, and a few severely eroded areas. Included soils make up 10 to 12 percent of the map unit, but separate areas are generally less than 2 acres.

This soil is medium in natural fertility and high in content of organic matter. It is neutral to moderately alkaline throughout the profile. Permeability is moderately slow to slow, and the available water capacity is low. The high clay content, rock outcrop, and flagstones in the surface layer make tillage very difficult. The root zone is shallow. Depth to bedrock ranges from 10 to 20 inches. The shrink-swell potential is moderate.

A large part of the acreage is used for pasture. Many areas are covered with brush. A few areas where the soil contains no coarse fragments and slopes are less than 6 percent are used occasionally for cultivated crops.

This soil has low potential for row crops, pasture, and hay. The potential is also low for woodland and wildlife habitat. If rainfall is adequate and the soil is well managed, moderate yields can be obtained. A severe erosion hazard and difficulty in tillage make this soil poorly suited to cultivated crops. A ground cover of drought-resistant plants reduces runoff and helps to control erosion.

The potential for most urban use is low. The depth to rock, high clay content, and low strength are limitations.

Capability subclass VIe; woodland group 4d.

FcE—Fairmount-Rock outcrop complex, 12 to 30 percent slopes. This moderately steep and steep map unit occurs on hillsides, especially in the southern third of the survey area. The areas of Fairmount soils and Rock outcrop were so intermingled that mapping them separately was impractical. Fairmount soils are shallow and well drained. Rock outcrop covers 15 to 30 percent of the

surface area. Individual areas are irregularly shaped and generally range from 10 to about 75 acres.

Typically, Fairmount soils have a surface layer of dark brown flaggy silty clay about 11 inches thick. The subsoil extends to a depth of 17 inches. It is brown flaggy clay. Below 17 inches is hard limestone.

Included with this unit in mapping are small areas of Eden and Faywood soils and a few severely eroded areas. Included soils make up 10 to 20 percent of the unit, but separate areas are generally less than 3 acres.

The Fairmount soils are medium in natural fertility and high in content of organic matter. They are neutral to moderately alkaline throughout the profile. Permeability is moderately slow to slow, and the available water capacity is low. The slope, flagstones, and Rock outcrop make tillage very difficult. The root zone is shallow. Depth to bedrock ranges from 10 to 20 inches.

Many areas have been cleared. Some are used as pasture (fig. 9). Some are covered with brush and are reverting to woods.

The potential for row crops, hay, and pasture is low. The potential is low for woodland and wildlife habitat. Because of slope, rock outcrop, and a very severe erosion hazard, this Fairmount soil is poorly suited to row crops. Moderate pasture yields can be obtained if rainfall is adequate and this soil is well managed. A ground cover of drought-resistant plants reduces runoff and helps to control erosion.

The potential is low for woodland. The equipment limitation is severe.

The potential is low for most urban uses. Steep slopes and the depth to rock are limitations.

Capability subclass VIs; woodland group 4d.

FcF—Fairmount-Rock outcrop complex, 30 to 60 percent slopes. This very steep map unit occurs on hillsides and bluffs, particularly along the Kentucky River. The areas of Fairmount soils and Rock outcrop were so intermingled that mapping them separately was impractical. Fairmount soils are shallow and well drained. Rock outcrop covers 35 to 50 percent of the surface area and in places extends to heights of 200 to 300 feet. Individual areas commonly occur as long bands of 200 to 800 feet. Some are several hundred acres.

Typically, Fairmount soils have a surface layer of dark brown flaggy silty clay about 11 inches thick. The subsoil extends to a depth of 17 inches. It is brown flaggy clay. Below 17 inches is hard limestone.

Included with this unit in mapping are small areas of Eden soils and a few severely eroded areas. Included soils make up 10 to 20 percent of the unit, but separate areas are generally less than 3 acres.

This Fairmount soil is medium in natural fertility and high in content of organic matter. It is neutral to moderately alkaline throughout the profile. Permeability is moderately slow to slow, and the available water capacity is low. The slope and rock outcrop make tillage difficult. The root zone is shallow. Depth to bedrock ranges from 10 to 20 inches.

Most of the acreage is still wooded. A few areas have been cleared. Most cleared areas, however, are now covered with brush and are reverting to woods.

This unit has low potential for nearly all uses. It has low potential for wildlife habitat, however, and has some esthetic value. Steep slopes, Rock outcrop, and a very severe erosion hazard make this unit poorly suited to pasture or hay. A ground cover of drought-resistant plants reduces runoff and helps to control erosion.

The potential for woodland is low. The equipment limitation is severe.

This unit has low potential for urban use. Very steep slopes and the rock outcrop are limitations.

Capability subclass VIIs; woodland group 4d.

FdB—Faywood silt loam, 2 to 6 percent slopes. This moderately deep, well drained, gently sloping soil is on convex ridgetops throughout most of the survey area. It occurs as irregularly shaped areas that range from 2 to 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 30 inches. It is yellowish brown silty clay and clay that is firm when moist and sticky and plastic when wet. Limestone is at a depth of about 30 inches.

Included with this soil in mapping are small areas of Lowell and McAfee soils. Included soils make up 3 to 10 percent of the map unit, but separate areas are generally less than 2 acres.

This soil is medium in natural fertility and moderate in organic-matter content. It ranges from neutral to strongly acid throughout the profile. It has moderately good tilth and can be worked throughout a fairly wide range of moisture content. Permeability is moderately slow or slow, and the available water capacity is moderate. The root zone is moderately deep, but the clayey subsoil restricts the penetration of roots. Depth to bedrock is 20 to 40 inches. The clayey subsoil has a moderate shrink-swell potential.

Most of the acreage is used for row crops, hay, and pasture. A small acreage is used for homesites.

This soil has medium potential for most row crops, hay, and pasture plants commonly grown in the area. Moderate yields can be obtained under good management. Moderately good tilth can be easily maintained by returning crop residue. Erosion is a moderate hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitation is slight.

This soil has only medium potential for most urban use because of the depth to bedrock, low strength, moderate shrink-swell potential, and a clayey subsoil. Some of these limitations can be partly overcome by good design and careful installation. The shallowness over bedrock and the

moderately slow or slow permeability limit the use of this soil as a septic tank absorption field.

Capability subclass IIe; woodland group 3c.

FdC—Faywood silt loam, 6 to 12 percent slopes. This moderately deep, well drained, sloping soil commonly occurs on rolling ridgetops and around drainageways. Individual areas are irregularly shaped and range from about 3 to 15 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 30 inches. It is yellowish brown silty clay and clay that is firm when moist and sticky and plastic when wet. Limestone is at a depth of 30 inches.

Included with this soil in mapping are small areas of Lowell, McAfee, and Fairmount soils. Included soils make up 5 to 12 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and moderate in organic-matter content. It ranges from neutral to strongly acid throughout the profile. It has moderately good tilth and can be worked throughout a fairly wide range of moisture content. Permeability is moderately slow or slow, and the available water capacity is moderate. The root zone is moderately deep, but the clayey subsoil restricts the penetration of roots. Depth to bedrock is 20 to 40 inches. The subsoil has a moderate shrink-swell potential.

Most of the acreage is used for pasture, hay, and row crops. A small acreage is used for homesites.

This soil has medium potential for hay, pasture, and row crops. Moderate yields can be obtained under good management. Moderately good tilth is easily maintained by returning crop residue. Erosion is a severe hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitation is slight.

This soil has only medium potential for most urban use because of the depth to bedrock, slope, low strength, shrink-swell, and a clayey subsoil. Some of these limitations can be partly overcome by good planning and proper installation. The depth to bedrock and the moderately slow to slow permeability of the subsoil limit the use of this soil as a septic tank absorption field.

Capability subclass IIIe; woodland group 3c.

FdE—Faywood silt loam, 12 to 30 percent slopes. This moderately deep, well drained, moderately steep to steep soil occurs on upper hillsides and around drainageways. Individual areas are irregular in shape and range from about 5 to 25 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 30 inches. It is yellowish brown silty clay and clay that is firm when moist and sticky and plastic when wet. Limestone bedrock is at a depth of about 30 inches.

Included with this soil in mapping are small areas of McAfee, Fairmount, Eden, and Culleoka soils. Included soils make up from 5 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

This soil is medium in natural fertility and moderate in organic-matter content. It ranges from neutral to strongly acid throughout the profile. It has moderately good tilth and can be worked throughout a fairly wide range of moisture content. Permeability is moderately slow to slow, and the available water capacity is moderate. The root zone is moderately deep. Depth to bedrock is 20 to 40 inhes. The clayey subsoil has a moderate shrink-swell potential.

Most of the acreage is used as pasture. A small acreage having slopes of less than 20 percent is used for hay and cultivated crops. Some areas on steeper slopes are in woods or brush.

The potential for row crops is low. The potential for hay and pasture is medium. Moderate hay and pasture yields can be obtained under good management. Fairly good tilth can be maintained by returning crop residue.

Erosion is a very severe hazard in cultivated areas. Minimum tillage and the use of cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitation is severe.

This soil has low potential for most urban use because of slope, depth to rock, low strength, moderate shrink-swell potential, and a clayey subsoil. In areas of less than about 15 percent slopes, some of these limitations can be partly overcome by good planning and careful installation.

Capability subclass IVe; woodland group 3c.

Hu—Huntington silt loam. This deep, well drained, nearly level soil occurs on flood plains throughout the survey area. It is commonly flooded. Individual areas usually occur as long fairly narrow bands, 150 to 400 feet wide, that range from 10 to 45 acres.

Typically, the surface layer is dark brown silt loam about 12 inches thick. The subsoil extends to a depth of 66 inches. It is dark grayish brown and brown silt loam. The substratum to a depth of 74 inches is dark yellowish brown silt loam.

Included with this soil in mapping are small areas of Lindside, Boonesboro, and Ashton soils, and a few small areas of soils having a silty clay subsoil. The included soils make up 5 to 12 percent of the map unit, but separate areas are usually less than 2 acres.

This soil has high natural fertility and is moderate in organic-matter content. Reaction is usually medium acid to mildly alkaline throughout. Generally no lime is needed. Tilth is good, and the soil can be worked throughout a wide range of moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots. The seasonal high water table is between 3 and 6 feet.

Most of the soil is used for row crops, hay, and pasture.

This soil has high potential for most crops commonly grown in the area. If it is well managed, very high yields

can be obtained. Infrequent flooding occurs, generally in winter and early in spring, but crops are seldom damaged. Good tilth can be easily maintained by returning crop residue. In places, diversions are needed to intercept runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. Equipment limitations are slight.

This soil has low potential for most urban use because it is commonly flooded. In places the limitation may be partly overcome by good design and careful installation.

Capability class I; woodland group 1o.

Lc—Lawrence silt loam. This deep, somewhat poorly drained, nearly level soil occurs mainly on broad ridgetops and on stream terraces throughout most of the survey area. Individual areas are irregularly shaped and range from 2 to 8 acres.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil extends to a depth of about 62 inches. To 18 inches it is light yellowish brown mottled with brown, gray, and olive. Between 18 and 43 inches it is a very firm, compact, and brittle fragipan of mottled pale olive, light gray, and yellowish brown silty clay loam. Below the pan, the subsoil is mottled yellowish brown silty clay loam. The substratum to a depth of 75 inches is mottled pale brown, light gray, and yellowish brown silty clay.

Included with this soil in mapping are small areas of somewhat poorly drained soils that do not have a fragipan. Included soils make up 5 to 10 percent of the map unit, but separate areas are generally less than 2 acres.

This soil is low in natural fertility and organic-matter content. Except in limed areas, reaction is strongly acid or very strongly acid through the fragipan and very strongly acid through neutral below the pan. Tilth is fairly good. Permeability is slow, and the available water capacity is moderate. The root zone is moderately deep. Ponding and a seasonal high water table at about 1 to 2 feet during wet periods, however, restrict the root zone.

Most of the acreage is used for pasture and hay. A few areas are used for row crops.

This soil has medium potential for most row crops, hay, and pasture plants commonly grown in the area. If drainage is adequate and the soil is well managed, moderate yields can be obtained. Alfalfa and tobacco, however, are subject to damage during wet periods. Areas on stream terraces along major streams are subject to rare flooding. Fairly good tilth can be easily maintained by returning crop residue.

The potential is high for woodland. The equipment limitation is moderate.

This soil has low potential for most urban use. Wetness and slow permeability are limitations, but these limitations can be partly overcome with good design and careful installation. Wetness and slow permeability limit the use of this soil as a septic tank absorption field.

Capability subclass IIIw; woodland group 2w.

Ld—Lindside silt loam. This deep, moderately well drained, nearly level soil occurs on flood plains throughout the survey area. It is commonly flooded. Individual areas generally occur as fairly long bands, 150 to 300 feet wide, that range from 5 to 25 acres.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is brown silt loam that extends to a depth of 43 inches. Below 18 inches, it is mottled with gray. The substratum to a depth of 60 inches or more is dark yellowish brown silty clay loam.

Included with this soil in mapping are small areas of Newark and Huntington soils. The included soils make up 10 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

This soil has high natural fertility and moderate organic-matter content. Reaction ranges from mildly alkaline to strongly acid in the surface layer and subsoil, and from medium acid to mildly alkaline in the substratum. Permeability is moderate, and the available water capacity is high. The soil is easy to till, but the seasonal high water table is within 1 1/2 to 3 feet of the surface during wet periods. The root zone is deep.

Most areas are used for row crops, hay, or pasture.

This soil has a high potential for most row crops, hay, and pasture plants commonly grown in the area. Usually, no drainage is needed. Additional drainage would permit earlier planting and reduce the danger of damage to crops like alfalfa and tobacco during wet periods. Good tilth can be easily maintained by returning crop residue. This soil is subject to flooding in winter and early in spring. In places, diversions are needed to intercept the runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitation is moderate.

This soil has low potential for most urban use because it is subject to common flooding and has a seasonal high water table within 1 1/2 to 3 feet of the surface during wet periods. In some places the limitations can be overcome by good design and careful installation.

Capability class I; woodland group 1w.

LwB—Lowell silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil occurs on ridgetops. Individual areas are irregularly shaped and vary between 2 to 12 acres.

Typically, the surface layer is brown silt loam about 11 inches thick. The subsoil extends to a depth of 53 inches. It is strong brown silty clay to 16 inches and strong brown clay to 53 inches. The clay is mottled with shades of brown, gray, and red below 23 inches. Hard limestone rock is below 53 inches.

This soil is moderately high in natural fertility and moderate in organic-matter content. It has good tilth and can be cultivated over a fairly wide range of moisture content. Unless limed, the soil ranges from slightly acid to very strongly acid to a depth of 23 inches, and below 23 inches it is strongly acid to mildly alkaline. Permeability is moderately slow, and the available water capacity is high.

The root zone is deep. Depth to bedrock ranges from 40 to 80 inches. The clayey subsoil has a moderate shrink-swell potential.

Included with this soil in mapping are small areas of Faywood and Maury soils. Included soils make up 5 to 10 percent of the map unit. The areas of inclusions are generally less than 2 acres.

Most of this soil is being used for cultivated crops, hay, and pasture. Relatively small areas are used for homesites and subdivisions.

The potential is high for all row crops, hay, and pasture plants commonly grown in the area, and high yields can be obtained under good management. Burley tobacco is a major crop. Good tilth is easily maintained by returning crop residue. Erosion is a moderate hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitations are moderate.

This soil has medium potential for most urban use. Low strength, shrink-swell, moderately slow permeability, and for some purposes depth to rock, are limitations. Some of these limitations can be minimized by good design and proper installation. Moderately slow permeability of the subsoil limits the use of this soil as a septic tank absorption field.

Capability subclass IIe; woodland group 3c.

LwC—Lowell silt loam, 6 to 12 percent slopes. This is a deep, well drained, sloping soil on ridgetops and around heads of drainageways. The areas are irregularly shaped and range from 3 to 20 acres.

Typically, the surface layer is brown silt loam about 11 inches thick. The subsoil extends to a depth of 53 inches. It is strong brown silty clay to a depth of 16 inches and strong brown clay to 53 inches. The clay is mottled in shades of brown, gray, and red below 23 inches. Hard limestone is below 53 inches.

This soil is moderately high in natural fertility and moderate in organic-matter content. This soil has good tilth and can be cultivated over a wide range of moisture content. Unless limed, it is slightly acid to very strongly acid to a depth of 23 inches, and below 23 inches it is strongly acid to mildly alkaline. Permeability is moderately slow, and the available water capacity is high. The root zone is deep. Depth to bedrock ranges from about 40 to 80 inches. The clayey subsoil has a moderate shrink-swell potential.

Included with this soil in mapping are small areas of Faywood and Maury soils, and a few severely eroded areas with strong brown silty clay loam surfaces. Included soils make up 5 to 15 percent of the map unit, but individual areas are less than 3 acres in size.

Most of the acreage is cleared and used for cultivated crops, hay, and pasture. Small areas are used for homesites and subdivisions.

This soil has medium potential for row crops, hay, and pasture. Fairly high yields can be obtained under good management. Burley tobacco is commonly grown. Good tilth is easily maintained by returning crop residue. Erosion is a severe hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitations are moderate.

This soil has medium potential for most urban use. Slope, low strength, shrink-swell, moderately slow permeability, and for some uses depth to rock, are limitations. Some of these limitations can be minimized by good design and careful installation. Moderately slow permeability of the subsoil and in some places, depth to bedrock, limit this soil for use as a septic tank absorption field.

Capability subclass IIIe; woodland group 3c.

MlA—Maury silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on broad ridgetops particularly in the northern part of the survey area. Individual areas are irregularly shaped and vary between 2 and 10 acres.

Typically, this soil has a dark brown silt loam surface layer about 8 inches thick. The subsoil extends to a depth of 80 inches. It is brown heavy silt loam to a depth of 16 inches, reddish brown silty clay loam to a depth of 27 inches, and yellowish red silty clay and clay to a depth of 80 inches. The substratum, to a depth of 96 inches, is dark brown clay.

Natural fertility is high, and content of organic matter is moderate. The surface layer is neutral to strongly acid, the upper part of the subsoil slightly acid to strongly acid, and the lower part of the subsoil medium acid to very strongly acid. It has good tilth and can be worked throughout a wide range of moisture content. Permeability is moderate to moderately rapid, and the available water capacity is high. The root zone is deep and can be easily penetrated by plant roots.

Included in mapping are small areas of Lowell and Donerail soils. The included soils make up 5 to 10 percent of the map unit, but separate areas are usually less than 2 acres.

Most of the acreage is being used for row crops and hay. A few areas are used for urban purposes.

The potential is high for growing row crops, hay, and small grain. Crops like alfalfa and burley tobacco grow well. Very high yields can be obtained under good management. Good tilth is easily maintained by returning crop residue. The erosion hazard is slight in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

The potential for woodland is high. The equipment limitations are slight.

The soil has high potential for most urban uses and has no severe limitations.

Capability class I; woodland group 2o.

MlB—Maury silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on ridgetops, especially in the northern and central parts of the survey

area. Individual areas are generally irregularly shaped and range from about 3 to 30 acres.

Typically, this soil has a dark brown silt loam surface layer about 8 inches thick. The subsoil extends to a depth of 80 inches. It is brown heavy silt loam to a depth of 16 inches, reddish brown silty clay loam to 27 inches, and yellowish red silty clay and clay to 80 inches. The substratum, to a depth of 96 inches, is dark brown clay.

Natural fertility is high, and the content of organic matter is moderate. The surface layer ranges from neutral to strongly acid, the upper part of the subsoil from slightly acid to strongly acid, and the lower part of the subsoil from medium acid to very strongly acid. Permeability is moderate to moderately rapid, and the available water capacity is high. The tilth is good, and the soil can be worked throughout a wide range of moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included in mapping are small areas of McAfee, Faywood, and Lowell soils. The included soils make up 5 to 15 percent of the map unit, but separate areas are usually less than 3 acres.

Most of the acreage is used for row crops, hay, and pasture, and a significant acreage is used for urban purposes.

It has a high potential for growing row crops, hay, pasture, and small grain. Alfalfa, burley tobacco, and Kentucky bluegrass are well suited to this soil. Very high yields can be obtained under good management (fig. 10). Good tilth can be easily maintained by returning crop residue. The erosion hazard is moderate in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

The potential is high for woodland. The equipment limitations are slight.

This soil has high potential for most urban uses and has no severe limitations.

Capability subclass IIe; woodland group 2o.

MIC—Maury silt loam, 6 to 12 percent slopes. This deep, well drained, sloping soil occurs mainly along the sides of ridges and around heads of drainageways, particularly in the northern and central parts of the survey area. Individual areas are generally irregularly shaped and range from about 2 to 25 acres.

Typically, this soil has a dark brown silt loam surface layer about 8 inches thick. The subsoil extends to a depth of 80 inches. It is brown heavy silt loam to a depth of 16 inches, reddish brown silty clay loam to 27 inches, and yellowish red silty clay and clay to 80 inches. The substratum, to a depth of 96 inches, is dark brown clay.

Natural fertility is high, and the content of organic matter is moderate. The surface layer ranges from neutral to strongly acid, the upper part of the subsoil from slightly acid to strongly acid, and the lower part of the subsoil from medium acid to very strongly acid. Permeability is moderate to moderately rapid, and the available water capacity is high. The tilth is good, and the soil can be worked throughout a wide range of moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included in mapping are small areas of McAfee, Faywood, and Lowell soils. The included soils make up 10 to 15 percent of the map unit, but separate areas are usually less than 2 acres.

Most of the acreage is used for hay, pasture (fig. 11), and row crops. A small acreage is used for urban purposes.

The potential is medium for row crops, hay, and pasture. Alfalfa and Kentucky bluegrass are suited to this soil. Moderately high yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. The erosion hazard is severe in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

The potential for woodland is high. The equipment limitations are slight.

Generally, this soil has medium potential for most urban use because of slope, the clayey subsoil, and low strength. In some places these limitations may be partially overcome by good planning, reshaping, and proper installation.

Capability subclass IIIe; woodland group 2o.

MnB—McAfee silt loam, 2 to 6 percent slopes. This moderately deep, well drained, gently sloping soil occurs on convex ridgetops throughout most of the survey area. Individual areas are irregularly shaped and range from 2 to 35 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of 25 inches. It is firm, brown heavy silty clay loam to a depth of 15 inches and very firm reddish brown silty clay below. The substratum to a depth of 30 inches is extremely firm dark reddish brown clay. Limestone is at 30 inches.

This soil is moderately high in natural fertility and moderate in content of organic matter. It ranges from medium acid to neutral in the surface layer and subsoil. Permeability is moderately slow, and the available water capacity is moderate. The tilth is good, and this soil can be cultivated over a fairly wide range of moisture content. The root zone is moderately deep. Depth to bedrock is from 20 to 40 inches. The clayey subsoil has a moderate shrink-swell potential.

Included with this soil in mapping are small areas of Maury and Faywood soils. Included soils make up 3 to 12 percent of the map unit, but separate areas are less than 2 acres.

Most areas have been cleared, and the acreage is used mainly for row crops, hay, and pasture. A small acreage is used for homesites and subdivisions.

The potential is medium for most row crops, hay, and pasture plants commonly grown in the area. Burley tobacco, red clover, and Kentucky bluegrass are commonly grown. Moderately high yields can be obtained under good management. Good tilth can be easily maintained by

returning crop residue. Erosion is a moderate hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has high potential for woodland. The equipment limitations are slight.

This soil has medium potential for urban use. The depth to limestone, the low strength, the moderate shrink-swell, and the clayey subsoil are limitations. Some of these limitations can be partly overcome by good design and careful installation. Depth to bedrock and moderately slow permeability limit this soil for use as a septic tank absorption field.

Capability subclass IIe; woodland group 3c.

MnC—McAfee silt loam, 6 to 12 percent slopes. This moderately deep, well drained, sloping soil occurs mainly on rolling ridgetops and around heads of drainageways. Individual areas are irregularly shaped and vary between 3 and 40 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of 25 inches. It is firm, brown heavy silty clay loam to a depth of 15 inches and very firm reddish brown silty clay below. The substratum to a depth of 30 inches is extremely firm dark reddish brown clay. Limestone is at 30 inches.

This soil is moderately high in natural fertility and moderate in content of organic matter. It ranges from medium acid to neutral in the surface layer and subsoil. The plow layer has good tilth, and it can be cultivated over a fairly wide range of moisture content. Permeability is moderately slow, and the available water capacity is moderate. The root zone is moderately deep. Depth to bedrock is from 20 to 40 inches. The clayey subsoil has a moderate shrink-swell potential.

Included with this soil in mapping are small areas of Maury and Faywood soils and small eroded areas with brown silty clay loam surface layers. Included soils make up 3 to 12 percent of the map unit, but separate areas are less than 2 acres.

Most areas have been cleared, and the acreage is used mainly for pasture (fig. 12), hay, and row crops. A very small acreage is used for homesites and subdivisions.

This soil has medium potential for most row crops, hay, and pasture plants commonly grown in the area. Burley tobacco is grown, and bluegrass pasture is extensive. Moderately high yields can be obtained under good management. Good tilth can be easily maintained by returning crop residue. Erosion is a severe hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitations are slight.

This soil has medium potential for most urban use. The limitations are depth to limestone, the low strength, the moderate shrink-swell, and the clayey subsoil. Some limitations can be partially overcome by good design and careful installation. Depth to limestone bedrock and moderately slow permeability limit this soil for use as septic tank absorption fields.

Capability subclass IIIe; woodland group 3c.

MnD—McAfee silt loam, 12 to 20 percent slopes. This moderately deep, well drained, moderately steep soil occurs on upper hillsides, around drainageways, and sink areas through most of the survey area. Individual areas are irregular in shape and vary from 3 to 40 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of 25 inches. It is firm, dark brown heavy silty clay loam to a depth of 15 inches and very firm, reddish brown silty clay below. The substratum to a depth of 30 inches is extremely firm dark reddish brown clay. Limestone is at 30 inches.

This soil is moderately high in natural fertility and moderate in organic-matter content. It ranges from medium acid to neutral in the surface layer and subsoil. Permeability is moderately slow, and the available water capacity is moderate. The surface layer has good tilth, and it can be cultivated over a fairly wide range in moisture content. The root zone is moderately deep. Depth to bedrock is from 20 to 40 inches. The clayey subsoil has a moderate shrink-swell potential.

Included with this soil in mapping are small areas of Faywood and Fairmount soils and small areas with brown silty clay loam surface layers. Included soils make up from 4 to 20 percent of the map unit, but separate areas are less than 3 acres.

Most of the acreage has been cleared and is used for pasture and hay. Some small scattered areas are under cultivation.

This soil has low potential for row crops and medium potential for hay and pasture. Moderate yields can be obtained under good managment. Moderately good tilth can be maintained by returning crop residue. Erosion is a very severe hazard on this soil in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, reduce runoff and help to control erosion.

This soil has medium potential for woodland. The equipment limitations are moderate.

The potential is low for most urban use because of the slope, the depth to limestone, the low strength, and the clayey subsoil. Some of these limitations can be minimized by good design and careful installation. Depth to limestone bedrock, the moderately slow permeability, and the slope limit this soil for use as septic tank absorption fields.

Capability subclass IVe; woodland group 3c.

MoC3—McAfee silty clay, 6 to 12 percent slopes, severely eroded. This moderately deep, well drained, sloping soil occurs on rolling ridgetops and around heads of drainageways. Individual areas are irregularly shaped and vary between 3 to about 25 acres. Soil erosion has removed most of the original surface layer. Shallow gullies are common.

Typically, the surface layer is brown firm silty clay about 6 inches thick. The subsoil extends to a depth of 19

inches. It is very firm reddish brown silty clay. The substratum to a depth of 24 inches is extremely firm dark reddish brown clay. Limestone occurs at 24 inches.

This soil is moderate in natural fertility and very low in content of organic matter. It ranges from medium acid to neutral in the surface layer and subsoil. The clayey surface layer is difficult to work. Permeability is moderately slow, and the available water capacity is low. The root zone is moderately deep. Depth to bedrock is from 20 to 40 inches. The shrink-swell potential is moderate.

Included with this soil in mapping are small areas of Faywood and Fairmount soils. Included soils make up from 3 to 10 percent of the map unit, but separate areas are less than 3 acres.

Practically all of this soil has been cleared and is used primarily for pasture and hay.

This soil has medium potential for pasture and low potential for most cultivated crops. Moderate yields can be obtained under good management. Erosion is a very severe hazard in cultivated areas. Minimum tillage and cover crops, including grasses and legumes, restore tilth, help to reduce runoff, and control erosion.

This soil has low potential for woodland. The equipment limitations are slight.

This soil has medium potential for most urban use because of the depth to limestone, the clayey surface texture, the low strength, the moderate shrink-swell, and the clayey subsoil. Some of these limitations can be partially overcome by good design and careful installation. Depth to limestone bedrock and moderately slow permeability limit this soil for septic tank absorption fields.

Capability subclass IVe; woodland group 4c.

MrD—McAfee-Rock outcrop complex, 6 to 20 percent slopes. This complex is made up of sloping to moderately steep McAfee soils and Rock outcrop. It occurs around drainageways and to a lesser extent on narrow ridgetops. The McAfee soil and Rock outcrop were mapped together as a complex because they are intermingled in patterns that made separation impractical. The McAfee soil is moderately deep and well drained. Rock outcrop makes up to 15 to 25 percent of the map unit. The rest is mainly McAfee soil. Individual areas are irregular in shape and ranges from 2 to 20 acres.

Typically, the surface layer of the McAfee soil is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of 25 inches. It is firm, brown heavy silty clay loam to a depth of 15 inches and very firm reddish brown silty clay below. The substratum to a depth of 30 inches is extremely firm dark reddish brown clay. Limestone is at 30 inches.

This McAfee soil is moderate in natural fertility and moderate in content of organic matter. It ranges from medium acid to neutral in the surface layer and subsoil. Permeability is moderately slow, and the available water capacity is moderate. The root zone is moderately deep. The surface layer has good tilth, and the rock outcrop limits the use of farm machinery. Depth to bedrock is from 20 to 40 inches. The clayey subsoil has moderate shrink-swell potential. About half of the acreage has been cleared and is used primarily for pasture (fig. 13).

Included with this complex in mapping are small areas of Faywood and Fairmount soils. Included soils make up from 3 to 15 percent of the map unit, but separate areas are less than 4 acres.

This unit has low potential for cultivated crops because of rock outcrop. Moderate pasture yields can be obtained with good management. Minimum tillage and vegetative cover, including grasses and legumes or trees, reduce runoff and help to control erosion.

This unit has medium potential for woodland. The equipment limitations are moderate to severe.

This unit has low potential for most urban use because of rock outcrop, depth to limestone, the low strength, the moderate shrink-swell, and the clayey subsoil. Some limitations can be partly overcome by good design and careful installation.

Capability subclass VIs; woodland group 3c.

Mt—Melvin silt loam. This deep, poorly drained, nearly level soil occurs on flood plains throughout most of the survey area, but particularly along Sinking Creek in the northern part of Jessamine County. The soil is commonly flooded, especially during winter and early spring. Individual areas are generally small, irregularly shaped, and about 3 to 8 acres in extent.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil extends to a depth of 22 inches. It is mottled, gray silt loam. The substratum, to a depth of 60 inches or more, is light silty clay loam that is mottled in shades of gray, brown, and olive.

This soil is moderately low in natural fertility and low in organic-matter content. Generally it ranges from slightly acid to mildly alkaline in reaction throughout the profile. Permeability is moderate, and the available water capacity is high. This soil is subject to common flooding. Tillage is easy, but flooding, ponding, and a seasonal high water table at or near the surface restricts the root zone.

Included with this soil in mapping are small areas of Dunning and Newark soils. Included soils make up about 10 to 12 percent of the map unit, but separate areas are usually less than 2 acres.

Most areas are used for row crops, hay, or pasture, and some areas are in woods.

This soil is suited to tile drainage. After it is drained, it has medium potential for most commonly grown row crops, hay, and pasture plants. Alfalfa and tobacco may be damaged during wet periods. On artificially drained areas, fairly good tilth can be easily maintained by returning crop residue. In places, diversions are needed to intercept runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitations are severe.

These soils have low potential for most urban use because of wetness and susceptibility to common flooding.

These limitations may be partially overcome in places by good design and careful installation.

Capability subclass IIIw; woodland group 1w.

Ne—Newark silt loam. This deep, somewhat poorly drained, nearly level soil occurs on flood plains throughout the survey area. It is commonly flooded. Individual areas usually occur in fairly short bands, 125 to 300 feet wide, and range from about 2 to 15 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil extends to a depth of 42 inches. It is brown silt loam to a depth of 18 inches and light brownish gray silt loam below. The substratum, to a depth of 60 inches or more, is silt loam mottled in shades of gray and brown.

This soil is moderate in natural fertility and moderate in organic-matter content. Reaction ranges from medium acid to mildly alkaline throughout the profile. Permeability is moderate, and the available water capacity is high. Tillage is easy, but flooding, ponding, and a seasonal high water table at about 1/2 to 1 1/2 feet during wet periods, restrict the root zone.

Included with this soil in mapping are small areas of Dunning, Melvin, and Lindside soils. Included soils make up about 10 to 15 percent of the map unit, but separate areas are generally less than 3 acres.

Most areas are used for row crops, hay, or pasture, and few areas are still in woods.

This soil is suited to tile drainage. After adequate drainage, it has high potential for most commonly grown row crops, hay, and pasture plants. Crops like alfalfa and tobacco may be damaged by a high water table during wet growing seasons. On artificially drained areas, good tilth is easily maintained by returning crop residue. In places, diversions are needed to intercept runoff from higher adjacent areas and divert it to grassed waterways.

This soil has high potential for woodland. The equipment limitations are moderate.

Newark soils have low potential for most urban use. Susceptibility to flooding and wetness are limitations, but in some cases these may be partially overcome by good design and careful installation.

Capability subclass IIw; woodland group 1w.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, rangeland, and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities; and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

Stewart M. Calvert, district conservationist, and Harold R. Wallace, district conservationist, Soil Conservation Service, helped prepare this section.

More than 193,000 acres in the survey area was used for crops and pasture in 1967, according to the Conservation Needs Inventory (*7*) Of this total, 107,000 acres was used for permanent pasture; 16,000 acres for row crops, mainly tobacco and corn; 6,000 acres for close-growing crops, mainly wheat and barley; 5,000 acres, for rotation hay and pasture; and 10,000 acres for hay. The rest was mostly idle cropland.

The soils in Jessamine and Woodford Counties have good potential for increased production of food. About 4,000 acres of potentially good cropland is currently used as woodland, and about 63,000 acres is pasture. In addition to the reserve productive capacity represented by this land, food production could also be increased considerably by extending the latest crop production technology to

all cropland in the survey area. This soil survey can help facilitate the application of such technology.

The acreage in crops and pasture has gradually decreased as more and more land is used for urban development. In 1967, about 9,000 acres in the survey area was urban and built-up land. This acreage has increased at the rate of about 200 acres per year. The use of this soil survey to help make land use decisions that will influence the future role of farming in the survey area is explained under the heading "General soil map for broad land use planning."

Soil erosion is the major concern on about four-fifths of the cropland and pasture in the survey area. If the slope is more than 2 percent, erosion is a hazard. In most parts of Jessamine and Woodford Counties, the slope is more than 2 percent.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Lowell, Eden, Faywood, and McAfee soils, and on soils that have a layer in or below the subsoil that limits the depth of the root zone. Such layers include a fragipan, as in Lawrence soils, or bedrock, as in Culleoka, Fairmount, Faywood, Eden, and McAfee soils. Erosion also reduces productivity on soils that tend to be droughty, such as Fairmount, Faywood, Eden, and McAfee soils. Second, soil erosion on farmland results in sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps a plant cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass for forage crops in the cropping system reduce erosion on sloping land. They also provide nitrogen and improve tilth for the following crop.

Slopes are so short and irregular that contour tillage or terracing is not practical in some areas of the sloping Culleoka, Eden, Faywood, and McAfee soils. On these soils, a cropping system that provides a substantial plant cover is required to control erosion unless minimum tillage is practiced. Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area, but they are more difficult to use successfully on soils that have a clayey surface layer, such as Eden soils and severely eroded McAfee soils. No tillage for corn, which is common on an increasing acreage, is effective in reducing erosion on sloping land and can be adapted to most soils in the survey area. It is more difficult to practice successfully, however, on the soils that have a clayey surface layer.

Terraces and diversions reduce the length of slope and thus reduce runoff and the risk of erosion. They are practical on the deep, well drained soils that have regular slopes, such as Maury soils. Soils having irregular slopes, a clayey subsoil that would be exposed in terrace channels, or bedrock at a depth of less than 40 inches, such as Faywood and McAfee soils, are less suitable for terraces and diversions.

Contouring and contour stripcropping are widespread erosion control practices in the survey area. They can be best adapted to soils that have smooth uniform slopes, including most areas of the sloping Maury, Elk, and Lowell soils.

Information on erosion control practices for each kind of soil is contained in the Technical Guide, which is available in local offices of the Soil Conservation Service.

Soil drainage is the major management need on about 2 percent of the acreage used for crops and pasture in the survey area. Some soils are so wet that the production of crops common to the area is generally not possible. Examples are the poorly drained Melvin soils and the very poorly drained Dunning soils, which make up about 1,700 acres in the survey area.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Lawrence and Newark soils, which make up about 1,900 acres.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained and very poorly drained soils that are used for intensive row cropping. Drains have to be more closely spaced in the slowly permeable soils than in the more permeable soils. Tile drainage is very slow in Lawrence soils. Finding adequate outlets for tile drainage systems is difficult in many areas of Dunning, Melvin, Newark, and Lawrence soils.

Soil fertility is moderate in most soils on uplands in the survey area. All but Eden and Fairmount soils are naturally acid. The soils on flood plains, such as Dunning, Huntington, Lindside, and Newark soils, range from medium acid to mildly alkaline and are naturally higher in plant nutrients than most soils on the uplands. Ashton and Elk soils are on stream terraces. The Ashton soil ranges from medium acid to neutral. The Elk soil is strongly acid to medium acid.

Many soils on uplands are medium acid or strongly acid in their natural state. If they have never been limed, applications of ground limestone are required to raise the pH level sufficiently for good growth of alfalfa and other crops that grow only on nearly neutral soils. Available phosphorus and potash levels are naturally low in some of these soils. The Maury and McAfee soils commonly contain more phosphorus than most other upland soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crops, and on the expected level of yields. The Cooperative Extension

Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the survey area have a surface layer of silt loam that is granular and porous and moderate in content of organic matter. Generally, the structure of such soils is good, except in places where continuous row cropping has lowered the organic matter content and has damaged soil structure. Regular additions of crop residue, manure, and other organic material can help in increasing the supply of organic matter and improving soil structure.

Fall plowing is generally not a good practice on the soils in the survey area. About four-fifths of the cropland consists of sloping soils that are subject to damaging erosion if they are plowed in fall.

The dark colored Dunning soils are clayey. Tilth is a concern because these soils often stay wet until late in spring. If wet when plowed, they tend to be very cloddy when dry and good seedbeds are difficult to prepare. Fall plowing on such wet soils generally results in good tilth in spring.

Field crops suited to the soils and climate of the survey area include some that are not now commonly grown. Corn and tobacco are the principal row crops. Grain sorghum, small grain, and some vegetables can be grown if economic conditions are favorable.

Wheat, barley, rye, and oats are the common close-growing crops. Grass seed can be produced from orchard grass, fescue, timothy, and bluegrass.

Special crops grown commercially in the survey area are vegetables, small fruits, strawberries, tree fruits, and nursery plants. The acreage of these crops could be increased, and other special crops could be introduced. A small acreage throughout the survey area is used for melons, strawberries, raspberries, tomatoes, sweet corn, and other vegetables and small fruits. In addition, large areas can be adapted to other special crops such as grapes and many vegetables. Apples and peaches are the most important tree fruits grown in the survey area.

Deep soils that have good natural drainage and that warm up early in spring are well suited to many vegetables and small fruits. In the survey area these are the Elk, Elk Variant, Lowell, Ashton, and Maury soils that have slopes of less than 6 percent and total about 70,000 acres.

Most of the deep, well drained soils in the survey area are suitable for orchards and nursery plants. Soils in low positions where frost is frequent and air drainage is poor, however, generally are poorly suited to early vegetables, small fruits, and orchards.

The latest information and suggestions on growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Farming and other land uses are competing for additional acreages in the survey area. About 9,000 acres was urban or built-up land in 1967, according to the Conservation Needs Inventory. Much of this acreage was well suited as cropland. Each year additional land is being developed for urban uses in Nicholasville, Versailles, and other cities in the survey area.

In general, the soils in the survey area that are well suited to crops are also well suited to urban development. The data about specific soils in this soil survey can be used in planning future land use patterns. The potential productive capacity in farming should be weighed against the soil limitations and potential for nonfarm development.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the

management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system as used in this survey area, all kinds of soil are grouped at two levels: capability class and subclass (*13*). These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except those named at a level higher than the series are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil mapping unit in the section "Soil maps for detailed planning."

Woodland management and productivity

Charles A. Foster, forester, Soil Conservation Service, helped prepare this section.

In the early days, Jessamine and Woodford Counties were nearly all covered with hardwood forest. On the uplands where the soil was deep were white oak, northern red oak, yellow-poplar, black walnut, white ash, sugar maple, black cherry, and other desirable trees. The shallow soils supported mainly black oak, scarlet oak, chestnut oak, and eastern redcedar. The lowlands along stream valleys supported sweetgum, pin oak, sycamore, willow, and red maple.

The forests have been cleared so that crops can be grown, and at present only about 9 percent of the acreage in the two counties is woodland. This acreage includes trees left in odd areas in pasture to provide shade for cattle and low quality trees in rough, steep areas bordering streams and in steep bluff areas.

The market is good for good-quality oak, black walnut, yellow-poplar, and other desirable hardwoods. Many soils in Jessamine and Woodford Counties have the potential for producing more abundant and better quality wood products. In order to realize this potential, good management of existing woodland and establishment of woodland areas with adapted species of economic value are necessary. Such management should relate to the characteristics of the soils. Among the most important soil characteristics that affect the growth of trees are drainage, moisture-supplying capacity, depth of root zone, aeration, thickness and texture of the surface layer, and depth to bedrock or other restrictive layers.

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Mapping unit symbols for soils suitable for wood crops are listed, and the ordination (woodland group) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade or grow if openings are made in the tree canopy. The invading plants compete with native plants or planted seedlings by impeding or preventing their growth. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* means that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed for the control of undesirable plants.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands (*4, 5, 6, 9, 11*). Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

Richard L. Quiggins, area engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils

and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 10, for water management. Table 11 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 11 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 12 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor.*

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 11 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 12.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 10 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, and compaction

characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

Richard L. Quiggins, area engineer, Soil Conservation Service, helped prepare this section.

The soils of the survey area are rated in table 13 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 13 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Wildlife habitat

The wildlife of Jessamine and Woodford Counties consists of an estimated 34 species of mammals, 32 species of reptiles and amphibians, and 101 species of breeding birds. Probably many of the more than 200 other kinds of birds that visit Kentucky each year can be found in these counties during certain seasons.

The kinds of wildlife most important to man at present are those that furnish recreation, for example, hunting or economic gain, such as commercial trapping. The wildlife hunted and trapped in Jessamine and Woodford Counties are the cottontail, gray squirrel, fox squirrel, white-tailed deer, raccoon, red fox, mink, muskrat, bobwhite quail, mourning dove, woodcock, several species of ducks, and occasionally a few kinds of geese. The white-tailed deer and gray squirrel are classified as woodland wildlife; the rabbit, quail, and dove are considered openland wildlife; and the ducks, geese, mink, and muskrat represent the wetland wildlife.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they

affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants (*1*).

In table 14, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat (fig. 5). Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consis-

tence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering properties

Table 12 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 12 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 12 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2*).

The *Unified* system classifies soils according to properties that affect their use as construction material (*3*). Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance (*2, 10*). In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 15. The estimated classification, without group index numbers, is given in table 12. Also in table 12 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 16 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 17 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings

are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Physical and chemical analyses of selected soils

The results of physical analysis of several typical pedons of the survey area are given in table 18. The results of chemical analyses of these soils are given in table 19. The data presented are for samples from soil series that are important in the survey area. All samples were collected from carefully selected sites that are typical of the series and discussed in the section "Soil series and morphology." The soil samples were analyzed by the Kentucky Agricultural Experiment Station.

Most determinations, except those for grain-size analysis were made on soil material smaller than 2 millimeters in diameter. All capacity measurements are reported on an oven-dry basis. The methods that were used in obtaining the data are indicated in the list that follows. The codes, in parentheses, refer to published methods codes.

Coarse materials—(2-75 mm fraction) weight estimates of the percentages of all materials less than 75 mm (3B1).
Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).
Silt—(0.002-0.05 mm fraction) by difference, weight percentages of all materials less than 2 mm (3A1).
Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of materials less than 2 mm (3A1).
Organic carbon—dichromate, ferric sulfate titration (6A1a).
Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (602), sodium (6P2), potassium (6Q2).
Extractable acidity—barium chloride-triethanolamine (6H1a).
Cation-exchange capacity—ammonium acetate, pH 7.0 (5A1a).
Cation-exchange capacity—sodium acetate, pH 8.2 (5A2a).
Cation-exchange capacity—sum of cations (5A3a).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—potassium chloride (8C1c).
Aluminum—potassium chloride extraction, floride titration (6G1d).
Available phosphorus—(Bray No. 1).
Field sampling—site selection (1A1).
Field sampling—soil sampling (1A2).
Laboratory preparation—standard (air dry) material (1B1).
Particles < specified size > 2mm (2A2).
Particles < 2mm (2A1).
Data sheet symbols (2B).
Particles greater than 2 mm by field or laboratory weighing (3B1a).
Extractable bases (5B1a).
Exchangeable acidity (H+A1) method of Yuan procedure
Calcium carbonate equivalent. Procedure (236b) USDA Handbook 60, USDA Salinity Laboratory 1954 (6N7).

Engineering test data

The results of analyses of engineering properties of several typical soils of the survey area are given in table 15.

The data presented are for soil samples that were collected from carefully selected sites. The soil profiles sampled are typical of the series discussed in the section "Soil series and morphology." The soil samples were analyzed by the Division of Research, Bureau of Highways, Department of Transportation, Commonwealth of Kentucky.

The methods used in obtaining the data are listed by code in the next paragraph. Most of the codes, in parentheses, refer to the methods assigned by the American Association of State Highway and Transportation Officials. The codes for Unified classification are those assigned by the American Society for Testing and Materials.

The methods and codes are AASHTO classification (M-145-73); Unified classification (D-2487-69); mechanical analysis (T88-72); liquid limit (T89-8); plasticity index (T90-70); and moisture-density, method A (T99-74).

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*14*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 20, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*12*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Ashton series

The Ashton series consists of deep, well drained, moderately permeable soils. These soils formed in alluvial and colluvial material derived primarily from limestone. They are on low stream terraces, along foot slopes, and in upland depressions. Slopes range from 0 to 6 percent.

Ashton soils are geographically associated with Elk, Huntington, and Lindside soils. Elk soils have a lighter colored A horizon than Ashton soils. Huntington and Lindside soils occupy lower positions on the landscape.

Typical pedon of Ashton silt loam in an area of Ashton silt loam, 2 to 6 percent slopes, near Hickman Creek, 100

yards south of Crisman Mill Road bridge, 300 yards west of Logana Road, and about 1 1/4 miles south of Bethany church, Jessamine County.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.
B1—8 to 22 inches; brown (7.5YR 4/4) silt loam; weak fine subangular blocky structure; friable; common fine roots; medium acid; clear smooth boundary.
B2t—22 to 40 inches; brown (7.5YR 4/4) heavy silt loam; weak medium subangular blocky structure; friable; few fine roots; few clay films; few small black concretions; medium acid; gradual smooth boundary.
C—40 to 61 inches; dark yellowish brown (10YR 4/4) silt loam; massive, friable; common small black concretions; medium acid.

Solum thickness ranges from 40 to 60 inches. Content of coarse fragments, mostly small chert and rock fragments, is less than 5 percent. Reaction ranges from neutral to medium acid throughout.

The Ap horizon is 7 to 10 inches thick. It has hue of 7 5YR or 10YR, value of 3, and chroma of 2 or 3.

The B horizon is 30 to 50 inches thick. It has hue of 7.5YR or 10YR, value of 4, and chroma of 3 or 4. Texture is silt loam or light silty clay loam.

The C horizon is silt loam or light silty clay loam. In some pedons it has thin strata of silty clay.

Boonesboro series

The Boonesboro series consists of moderately deep, well drained, moderately permeable soils. These soils formed in material washed principally from limestone. They occur on flood plains along small streams throughout the survey area. Slopes range from 0 to 4 percent.

Boonesboro soils are associated on the landscape with Huntington, Lindside, and Ashton soils. The associated soils are deeper over bedrock than Boonesboro. Ashton soils occur at higher elevations.

Typical pedon of Boonesboro silt in an area of Boonesboro silt loam along East Fork Creek about 1 1/2 miles south of Troy in Jessamine County:

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; moderate fine and medium granular structure; very friable; many fine roots; slightly acid; gradual smooth boundary.
A1—9 to 21 inches; dark brown (10YR 3/3) silt loam; moderate medium granular structure; very friable; common fine roots; neutral; gradual smooth boundary.
B—21 to 28 inches; brown (10YR 4/3) gravelly silt loam; moderate medium granular structure; very friable; few fine roots; 18 percent fragments of limestone and chert; neutral.
R—28 inches; hard limestone.

Depth to bedrock ranges from 20 to 40 inches. Reaction ranges from slightly acid to mildly alkaline throughout.

The A horizon is 12 to 24 inches thick. It has hue of 10YR and chroma of 2 or 3. Content of limestone and chert fragments ranges from 0 to 10 percent.

The B horizon is 7 to 13 inches thick. It has hue of 10YR and 7.5YR and chroma of 2 through 4. Content of limestone and chert fragments 2 millimeters to 3 inches in diameter ranges from 15 to 40 percent. Texture is gravelly silt loam or gravelly silty clay loam.

Culleoka series

The Culleoka series consists of moderately deep, well drained soils that are moderately rapidly permeable. These soils formed in residuum from siltstone and calcareous sandstone and some interbedded shale and limestone. They are on rolling ridgetops and upper hillsides. Slopes range from 6 to 30 percent.

Culleoka soils are associated with Faywood and Lowell soils on ridgetops. They generally occur above the Eden soils on hillsides. All of these soils have more clay in the B horizon than Culleoka soils. Lowell soils are deep and Faywood soils moderately deep over hard limestone. Eden soils are moderately deep over soft clay shale.

Typical pedon of Culleoka silt loam in an area of Culleoka silt loam, 6 to 12 percent slopes, in a pasture, three-fourths of a mile east of county road 1432, one-fourth mile west of county highway 39, and 1 1/2 miles north of the Kentucky River, Jessamine County:

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; many fine roots; 5 percent siltstone channers up to 4 inches in length; strongly acid; clear smooth boundary.
B1—5 to 16 inches; yellowish brown (10YR 5/4) heavy silt loam; weak fine subangular blocky structure; friable; many fine roots; 10 percent siltstone channers up to 4 inches in length; medium acid; clear smooth boundary.
B21t—16 to 24 inches; yellowish brown (10YR 5/6) light silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common thin clay films; 10 percent yellowish brown siltstone fragments up to 10 inches in length; few small black concretions; medium acid; gradual smooth boundary.
B22t—24 to 30 inches; yellowish brown (10YR 5/6) flaggy silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common thin clay films; 18 percent yellowish brown siltstone fragments up to 15 inches in length; few small black concretions; medium acid; gradual wavy boundary.
C—30 to 38 inches; mottled yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) flaggy light silty clay loam; relic platy structure; firm; few fine roots; 30 percent yellowish brown siltstone fragments from 4 to 15 inches in length; medium acid.
R—38 inches; siltstone bedrock.

Solum thickness ranges from 20 to 37 inches. Depth to bedrock, dominantly siltstone, is 20 to 40 inches. Reaction ranges from medium to strongly acid in the solum and from slightly to strongly acid in the substratum. Content of coarse fragments, dominantly siltstone, ranges from 5 to 35 percent in the A horizon, from 10 to 35 in the B horizon, and from 25 to 60 percent in the C horizon.

The Ap horizon is 5 to 12 inches thick. It has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 2, 3, and 4. It is silt loam and its channery or flaggy analogs.

The B horizon is 10 to 30 inches thick. It has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 4 through 6. It is silt loam, loam, or silty clay loam, and their flaggy or channery analogs.

The C horizon has hue of 7.5YR, 10YR, and 2.5Y; value of 4 or 5; and chroma of 4 or 6. In some pedons it has grayish mottles. Texture ranges from flaggy loam through flaggy silty clay loam.

Donerail series

The Donerail series consists of deep, moderately well drained soils that are slowly permeable. These soils formed in clayey residuum or alluvium from phosphatic limestone. They occur on broad ridgetops, along foot slopes, and on a few terraces. Donerail soils occur generally in the northern half of the survey area. Slopes range from 2 to 6 percent.

Donerail soils are associated on the landscape with Maury and McAfee soils. The associated soils are better drained than Donerail soils and have a redder B horizon. McAfee soils are shallower over bedrock.

Typical pedon of Donerail silt loam in an area of Donerail silt loam, 2 to 6 percent, in a pasture about one-fourth mile southeast of road junction on U.S. Highway 60, 1 mile east of Versailles, Woodford County:

Ap—0 to 11 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable; many fine roots; medium acid; gradual smooth boundary.

B1—11 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; many fine roots; few thin clay films; few small hard concretions; slightly acid; clear smooth boundary.

B2t—17 to 29 inches; dark yellowish brown (10YR 4/4) silty clay; few fine distinct mottles of strong brown (7.5YR 5/6) and few fine faint mottles of yellowish brown (10YR 5/4) in lower 3 inches; moderate medium subangular blocky structure; firm, sticky, plastic; few fine roots; common clay films; common small black concretions; medium acid; clear smooth boundary.

B3—29 to 35 inches; yellowish brown (10YR 5/6) clay; common distinct dark grayish brown (2.5Y 5/2), very dark gray (N 3/0), and strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm, sticky, plastic; few fine roots; common clay films; common small black concretions; medium acid; clear smooth boundary.

C—35 to 60 inches; yellowish brown (10YR 5/6) clay with many medium distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/8) mottles; massive; very firm, sticky, plastic; many small black concretions and much black concretionary material; medium acid.

Thickness of the solum ranges from about 32 to 48 inches, and depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to neutral in the solum and from medium acid to mildly alkaline in the C horizon.

The Ap horizon is 10 to 16 inches thick. It has hue of 7.5YR and 10YR, value of 3, and chroma of 2 or 3.

The B1 horizon is 0 to 6 inches thick. It has hue of 7.5YR and 10YR and chroma of 3 or 4. Texture is silt loam or silty clay loam.

The B2t horizon is 10 to 20 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 4 or 6. Texture is silty clay loam or silty clay.

The B3 horizon is 0 to 15 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, chroma of 4 to 6, and mottles in shades of gray. In some pedons the B3 horizon is highly mottled and has no dominant color. Texture is silty clay or clay.

The C horizon is similar in color and texture to the B3 horizon. In some pedons it is highly mottled and has no dominant color.

Dunning series

The Dunning series consists of deep, very poorly drained soils that are slowly permeable. These soils formed in recent fine textured alluvium washed from soils of limestone origin. Slopes are 0 to 2 percent.

Dunning soils are associated on the landscape with Melvin and Newark soils. Melvin and Newark soils are less than 35 percent clay and do not have a thick dark colored A horizon.

Typical pedon of Dunning silty clay loam in an area of Dunning silty clay loam along a stream about 1 mile west of Highway 39 and 1 1/4 miles south of Sulphur Well Community, Jessamine County:

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay loam; few fine distinct mottles of light olive brown (2.5YR 5/4) and dark brown (7.5YR 4/2); moderate fine and medium angular blocky structure; firm, sticky, plastic; common fine roots; neutral; gradual smooth boundary.

A1g—6 to 16 inches; very dark gray (10YR 3/1) silty clay loam; few fine distinct mottles of light olive brown (2.5Y 5/4) and dark brown (7.5YR 4/2); moderate fine and medium angular blocky structure; firm, sticky, plastic; common fine roots; neutral; gradual smooth boundary.

Bg—16 to 34 inches; dark gray (5Y 4/1) silty clay; common fine distinct mottles of pale olive (5Y 6/3), yellowish brown (10YR 5/6), and common medium and large faint mottles of dark gray (5Y 3/1); moderate coarse prismatic and blocky structure; firm, sticky, plastic; few small roots; about 2 percent reddish brown (5YR 5/4) concretions; neutral; gradual smooth boundary.

Cg—34 to 60 inches; dark gray (N 4/0) silty clay and thin (2 to 4 inches) strata of darker material; common medium and coarse distinct mottles of yellowish brown (10YR 5/6), small common distinct mottles of olive brown (2.5Y 4/4), and olive gray (2.5Y 5/2); massive; firm, sticky, and plastic; very few fine roots; 3 percent small dark concretions; neutral.

Thickness of the solum ranges from 30 to 50 inches. Thickness of the mollic epipedon ranges from 12 to 20 inches. Depth to bedrock ranges from 6 to 10 feet. The soil ranges from medium acid to mildly alkaline throughout.

The A horizon is 12 to 24 inches thick. It has hue of 10YR, value of 3 or 2, chroma of 1 or 2, and a few mottles in shades of brown (N 3/0 or N 2/0).

The Bg horizon is 15 to 30 inches thick. It has matrix colors in hue of 10YR through 5Y and value of 4 through 6. Texture ranges from heavy silty clay loam through clay.

The Cg horizon has matrix colors of dark gray (5Y 4/1; N 4/0), gray (5Y 5/1), and dark greenish gray (5GY 4/1; 5G 4/1). Texture ranges from clay loam and heavy silty clay loam through clay.

Eden series

The Eden series consists of moderately deep, well drained, slowly permeable soils. These soils formed in clayey residuum derived from calcareous shale, siltstone, and limestone. They occur mainly on hillsides and much less extensively on narrow ridgetops. Eden soils are dominantly in the southeastern part of Jessamine County. A small acreage occurs in the northwestern part of Woodford County. Slopes range from 6 to 50 percent.

Eden soils are associated on the landscape with Fairmount, Culleoka, Faywood, and Lowell soils. Fairmount soils are shallow over hard limestone. Faywood soils are moderately deep, and Lowell soils are deep. Culleoka soils are moderately deep over siltstone and sandstone and have a loamy B horizon.

Typical pedon of Eden flaggy silty clay in an area of Eden flaggy silty clay, 20 to 30 percent slopes, about 500 yards south of farm house, 70 feet east of driveway, 0.4 mile west of County Road 1269 junction with State Highway 39, Jessamine County:

Ap—0 to 5 inches; dark grayish brown (2.5Y 4/2) flaggy silty clay; moderate medium granular structure; friable, slightly sticky; common fine roots; 16 percent flagstones 6 to 15 inches in length and 5 percent channers 1 to 5 inches in length; neutral; abrupt smooth boundary.

B2t—5 to 18 inches; light olive brown (2.5YR 5/4) flaggy silty clay; strong fine and medium angular blocky structure; very firm, sticky and plastic; few fine roots; common thin clay films; 16 percent by volume of flagstones of limestone 6 to 15 inches in length; 5 percent weathered shale and siltstone fragments 1 to 5 inches long; mildly alkaline; clear smooth boundary.

B3—18 to 30 inches; light olive brown (2.5YR 5/4) flaggy silty clay; common fine distinct mottles of light yellowish brown (2.5Y 6/4) and yellowish brown (10YR 5/4); weak angular blocky structure; firm, sticky, plastic; very few fine roots; 20 percent flagstones of limestone 6 to 15 inches in length and 10 percent weathered shale and siltstone fragments 1 to 5 inches long; mildly alkaline; clear smooth boundary.

Cr—30 to 65 inches; olive (5Y 5/3) weathered interbedded shale and siltstones with some thin layers of fractured limestone.

Solum thickness is 15 to 30 inches. Reaction ranges from strongly acid to moderately alkaline throughout. Depth to paralithic contact ranges from 20 to 40 inches. Content of coarse fragments of limestone, shale, and siltstone ranges from 5 to 20 percent in the A horizon, from 15 to 35 percent in the B horizon, and from 30 to 60 percent in the C horizon.

The Ap horizon is 4 to 8 inches thick. It has hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 2 or 3. Texture ranges from silty clay loam to flaggy silty clay.

The B2t horizon is 8 to 20 inches thick. The B3 horizon is 0 to 10 inches thick. Both have hue of 10YR through 5Y, value of 4 or 5, and chroma of 3 through 6. The B3 horizon has mottles in shades of brown or gray. Texture ranges from flaggy silty clay to flaggy clay.

Elk series

The Elk series consists of deep, well drained soils with moderate permeability. These soils formed in alluvium washed from soils formed in residuum chiefly from limestone. They occur on terraces, mainly along the Kentucky River and its major tributaries. Slopes range from 2 to 20 percent but are dominantly 2 to 12 percent.

Elk soils are associated on the landscape with Ashton, Huntington, and Lindside soils. Huntington and Lindside soils, which occur on flood plains, do not have an argillic horizon. Ashton soils have a darker colored A horizon than Elk soils.

Typical pedon of Elk silt loam in an area of Elk silt loam, 2 to 6 percent slopes, in a pasture about 600 feet from farmhouse, 850 feet north of Kentucky Highway 29, 150 feet east of farm driveway, and 1 1/2 miles southwest of Wilmore:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak firm granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B1—8 to 18 inches; dark brown (7.5YR 4/4) heavy silt loam; weak medium subangular blocky structure; friable; common fine roots; medium acid; gradual smooth boundary.

B21t—18 to 37 inches; strong brown (7.5YR 5/6) light silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; thin patchy clay films; few small black concretions; strongly acid; gradual smooth boundary.

B22t—37 to 48 inches; strong brown (7.5YR 5/6) light silty clay loam; few fine faint light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; common thin clay films; few small black concretions; strongly acid; gradual smooth boundary.

C—48 to 64 inches; yellowish brown (10YR 5/6) light silty clay loam; common fine faint light yellowish brown (10YR 6/4) mottles; massive; friable; common small black concretions; few small pockets of gravel and chert; strongly acid.

Solum thickness ranges from 36 to 54 inches, and depth to rock is more than 60 inches. Unless limed, the soil ranges from medium acid through very strongly acid in the solum and from slightly acid through strongly acid in the C horizon.

The Ap horizon is 7 to 12 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 3 or 4.

The B horizon is 25 to 50 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 4 or 6. Texture is heavy silt loam or light silty clay loam.

Some pedons do not have a C horizon, and others are stratified fine sandy loam, loam, clay loam, or silty clay.

Elk Variant

The Elk Variant consists of deep, well drained soils that are moderately permeable. They formed in old alluvium of high terrace deposits and the underlying residuum of limestone. They are along broad ridgetops. The alluvium was washed from soils formed in residuum primarily from limestone. The Elk Variant occurs along former runs of the major streams in the southern part of the survey area. Slopes range from 2 to 6 percent.

The Elk Variant is geographically associated with Maury, McAfee, and Lowell soils. The associated soils have a higher clay content in the B horizon than the variant, and Maury and McAfee have a redder B2t horizon.

Typical pedon of Elk Variant silt loam in an area of Elk Variant silt loam, 2 to 6 percent slopes, in a meadow 500 yards north of Camp Nelson National Cemetery and about 9 miles south of Nicholasville in Jessamine County:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

B1—8 to 18 inches; brown (7.5YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; common fine roots; few pale brown silt coatings; medium acid; gradual smooth boundary.

B21t—18 to 48 inches; brown (7.5YR 4/4) light silty clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common thin clay films; few small dark brown concretions; strongly acid; gradual smooth boundary.

IIB22t—48 to 65 inches; brown (7.5YR 4/4) silty clay; moderate fine angular blocky structure; firm; very few fine roots; common clay films; 5 percent small chert fragments; few small dark brown concretions; strongly acid.

Solum thickness is more than 60 inches, and thickness of the alluvium is 30 to 60 inches. Content of coarse fragments, pebbles, and small chert fragments ranges from 0 to 4 percent in the Ap horizon and from 0 to 8 percent in the B2t horizon. Reaction is medium acid to strongly acid.

The Ap horizon is 7 to 10 inches thick. It has hue of 10YR, value of 4, and chroma of 3 or 4.

The B1 horizon is 0 to 15 inches thick. It has hue of 10YR and 7.5YR, value of 4 and 5, and chroma of 4 or 6. Texture is heavy silt loam or light silty clay loam.

The B21t horizon is 15 to 40 inches thick. It has hue of 10YR and 7.5YR, value of 4, and chroma of 4. The IIB22t horizon has hue of 7.5YR or 5YR, value of 4 and 5, and chroma of 4 or 6. Texture ranges from silty clay loam to silty clay.

Fairmount series

The Fairmount series consists of shallow, well drained soils that are moderately slowly to slowly permeable. These soils formed in residuum of weathered limestone and thin layers of shale. They occur principally on moderately steep to very steep hillsides and less extensively on sloping convex ridgetops. Slopes range from 6 to about 60 percent.

Fairmount soils are associated on the landscape with Faywood, McAfee, and Eden soils. The associated soils are deeper over bedrock than Fairmount. Eden and Faywood soils have a lighter colored A horizon.

Typical pedon of Fairmount flaggy silty clay in an area of Fairmount-Rock outcrop complex, 12 to 30 percent slopes, 500 yards south of house at end of lane, which is one-fourth mile south of blacktop road 1 1/2 miles southwest of Kentucky Highway 33 from an intersection 3 miles north of Troy and 7 miles south of Versailles:

A1—0 to 11 inches; dark brown (10YR 3/3) flaggy silty clay; moderate fine angular blocky structure; firm; many fine roots; 30 percent thin flat limestone frag-

ments 6 to 15 inches long; continuous black ped coatings; mildly alkaline; clear smooth boundary.
B2—11 to 17 inches; brown (10YR 4/3) flaggy clay; moderate fine and medium angular blocky structure; very firm; common fine roots; few fine pores; 30 percent thin flat limestone fragments 6 to 15 inches long; nearly continuous dark brown ped coatings; mildly alkaline; abrupt smooth boundary.
R—17 inches; hard gray limestone.

Solum thickness and depth to bedrock range from 10 to 20 inches. Reaction ranges from neutral to moderately alkaline, and some pedons are calcareous. The content of thin flat limestone fragments 1 to 15 inches long ranges from 5 to 35 percent.

The A horizon is 5 to 15 inches thick. It has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 3.

The B2 horizon is 4 to 14 inches thick. It has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is flaggy silty clay or flaggy clay. Some pedons have few to common mottles in shades of brown, gray, or olive.

Faywood series

The Faywood series consists of moderately deep, well drained soils that are moderately slowly or slowly permeable. These soils formed in clayey residuum from interbedded limestone and shale. They occur mainly on rolling ridgetops and strongly sloping hillsides throughout most of the survey area. Slopes range from 2 to 30 percent.

Faywood soils are associated geographically with Lowell, McAfee, Culleoka, and Eden soils. Lowell soils are deep over hard limestone. McAfee soils have a dark colored A horizon and a reddish B horizon. Eden soils are moderately deep over soft clay shale. Culleoka soils are moderately deep over siltstone and calcareous sandstone.

Typical pedon of Faywood silt loam in an area of Faywood silt loam, 6 to 12 percent slopes, along Scott's Ferry Road, about 1.6 miles west of junction of Scott's Ferry Road and Kentucky Highway 33:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.
B21t—6 to 21 inches; yellowish brown (10YR 5/4) silty clay; moderate medium subangular blocky structure; very firm, very sticky and plastic; common fine roots; thin continuous clay films in root channels and on ped faces; few fine black concretions; medium acid; gradual wavy boundary.
B22t—21 to 30 inches; yellowish brown (10YR 5/6) clay; common fine faint pale brown (10YR 6/3), light olive brown (2.5Y 5/4), and strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; very firm, very sticky, plastic; few fine roots; thin continuous clay films in root channels and on ped faces; few fine black concretions; medium acid; abrupt smooth boundary.
R—30 inches; limestone interbedded with calcareous shale.

Solum thickness and depth to bedrock range from 20 to 40 inches. The content of flagstones and channery fragments of limestone and shale ranges from 0 to 15 percent in the solum and up to 25 percent in the C horizon. Reaction ranges from neutral through strongly acid. The lower few inches just above bedrock, however, may be mildly alkaline.

The Ap horizon is 3 to 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A horizon is silt loam or silty clay loam. Structure is weak or moderate, very fine through medium, granular or subangular blocky. Consistence is friable or very friable.

The B2t horizon is 9 to 39 inches thick. It has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 6. The lower part is commonly mottled in shades of brown or olive. A few pedons are mottled with 2 or 3 chroma below 10 inches. Texture is silty clay, clay, or heavy silty clay loam. Structure ranges from weak through strong, very fine through medium, angular or subangular blocky. Consistence is firm or very firm, sticky or very sticky, and plastic.

The C horizon, if present, has the same color and texture as the lower part of the B22t horizon.

Huntington series

The Huntington series consists of deep, well drained soils that are moderately permeable. These soils formed in alluvium washed from soils derived mainly from limestone. They occur on flood plains throughout the survey area. Slopes range from 0 to about 4 percent but are dominantly 0 to 2 percent.

Huntington soils are associated on the landscape with Lindside, Newark, and Ashton soils. Lindside and Newark soils are not so well drained as Huntington soils. Ashton soils occur at elevations above Huntington.

Typical pedon of Huntington silt loam in an area of Huntington silt loam, about 500 yards southwest of farm house, 150 yards north of the Kentucky River, and approximately 2 miles southwest of Little Hickman Creek, Jessamine County:

Ap—0 to 12 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; gradual smooth boundary.
B1—12 to 21 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure; friable; many fine roots; slightly acid; gradual smooth boundary.
B2—21 to 66 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; slightly firm; few fine roots in upper part; slightly acid; gradual wavy boundary.

C—66 to 74 inches; dark yellowish brown (10YR 4/4) silt loam, stratified with fine sandy loam; massive; slightly acid.

Solum thickness is more than 40 inches. Content of coarse fragments of chert and limestone ranges from 0 to 3 percent. Gray mottles with chroma of 2 or lower may occur below a depth of 30 inches. Reaction ranges from medium acid to mildly alkaline.

The Ap horizon is 10 to 14 inches thick. It has hue of 7.5YR and 10YR, value of 2 or 3, and chroma of 2 or 3.

The B horizon is 30 to 65 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam or light silty clay loam.

The C horizon has colors similar to those of the B horizon. It commonly contains more sand than the B horizon. It is a stratified loam, sandy loam, or gravelly sandy loam.

Lawrence series

The Lawrence series consists of deep, somewhat poorly drained soils that are slowly permeable. These soils formed in material weathered from limestone and shale and in some areas from material washed from soils derived principally from limestone and shale. They occur in upland depressions and on the back side of stream terraces. The total acreage is small. Slopes are 0 to about 2 percent.

Lawrence soils occur on the landscape in association with Lowell, Faywood, Donerail, and Elk soils. All of the associated soils are better drained than Lawrence soils. Lowell, Faywood, and Donerail have more clay accumulation in the B horizon.

Typical pedon of Lawrence silt loam in an area of Lawrence silt loam, about 2 1/2 miles west of U.S. Highway 27, about three-fourths of a mile north of Kentucky Highway 169, Jessamine County:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint pale brown (10YR 6/3) mottles; weak fine granular structure; common fine roots; strongly acid; clear smooth boundary.

B2t—8 to 18 inches; light yellowish brown (2.5Y 6/4) light silty clay loam; common fine distinct pale brown (10YR 6/3), strong brown (7.5YR 5/6), and light brownish gray (2.5Y 6/2) mottles; few fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

Bx1—18 to 26 inches; mottled pale olive (5Y 6/3), light gray (5Y 7/1, 7/2); and yellowish brown (10YR 5/6) light silty clay loam; moderate very coarse prismatic structure parting to moderate medium angular and subangular blocks; very firm, compact and brittle; few fine roots between prisms; common thin clay films on blocks; few small black concretions; strongly acid; gradual wavy boundary.

Bx2—26 to 43 inches; mottled yellowish brown (10YR 5/6), light yellowish brown (2.5Y 6/4), pale olive (5Y 6/3), and light gray (5Y 7/1) light silty clay loam; moderate very coarse prismatic structure parting to moderate medium angular blocks; very firm, compact and brittle; common thin clay films on blocks; few small black concretions; strongly acid; gradual wavy boundary.

B3t—43 to 62 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light gray (5Y 7/1), pale olive (5Y 6/3), and common medium faint pale brown (10YR 6/3) mottles; moderate medium angular blocky structure; firm; thin gray (10YR 6/1) clay films; few small black concretions; strongly acid.

IIC—62 to 75 inches; mottled pale brown (10YR 6/3), light gray (5Y 7/1), and yellowish brown (10YR 5/6) silty clay; massive; firm; few small black concretions; medium acid.

Solum thickness ranges from 40 to 80 inches, and depth to bedrock from 60 to more than 100 inches. Soil reaction, except where the soil is limed, ranges from strongly to very strongly acid through the fragipan. The B3 and C horizons range from very strongly acid through neutral.

The Ap horizon is 6 to 12 inches thick. It has hue of 2.5Y through 10YR, value of 4 or 5, and chroma of 2 through 4.

The B2t horizon is 7 to 25 inches thick. It has matrix colors in hue of 2.5Y through 10YR, value of 5 or 6, and chroma of 3 through 6. Mottles with chroma of 2 or lower range from few to many. Some pedons have mottles in shades of brown. Texture is silt loam or silty clay loam. Some pedons have a thin B1 horizon that is 3 to 6 inches thick and has no gray mottles.

The Bx horizon is 10 to 50 inches thick. It has matrix and mottle colors in hue of 7.5YR through 2.5Y, value of 7 through 5, and chroma of 6 through 1. Texture is silt loam or silty clay loam.

The B3t horizon is 0 to 30 inches thick. It has hue of 7.5YR through 2.5Y, value of 5 or 4, and chroma of 4 or 6. Mottles are in shades of gray, olive, or brown. Texture is silt loam or silty clay loam.

The C horizon is mottled. Mottles are in shades of gray or brown. Texture is silt loam through silty clay. The C horizon in some pedons is not residuum from limestone.

Lindside series

The Lindside series consists of deep, moderately well drained soils that are moderately permeable. These soils formed in alluvium washed from soils derived mainly from limestone. They occur on flood plains throughout the survey area. Slopes are 0 to about 2 percent.

Lindside soils are associated on the landscape with Huntington, Newark, Melvin, and Ashton soils. Huntington is better drained than the Lindside soils and Newark and

Melvin are less well drained. The Ashton soil is better drained and occurs at elevations above Lindside.

Typical pedon of Lindside silt loam in an area of Lindside silt loam, on a flood plain about 1 mile north of Kentucky Highway 169, 1 1/4 miles northwest of junction of 169 and 595, and about 2 miles northeast of Nicholasville, Jessamine County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B1—7 to 18 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable; common fine roots; medium acid; clear wavy boundary.

B2—18 to 31 inches; brown (10YR 4/3) silt loam; many fine and medium distinct strong brown (7.5YR 5/6) mottles and few fine distinct grayish brown (10YR 5/2) and light grayish brown (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; medium acid; gradual smooth boundary.

B3—31 to 43 inches; brown (10YR 4/3) heavy silt loam; common medium distinct strong brown (7.5YR 5/6) mottles and common medium faint dark grayish brown (10YR 4/2) mottles; moderate medium and coarse subangular blocky structure; firm; few fine roots; medium acid; gradual smooth boundary.

C—43 to 62 inches; dark yellowish brown (10YR 4/4) light silty clay loam; common medium faint dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) mottles; massive; firm; few black concretions; slightly acid.

Solum thickness ranges from 30 to 50 inches. Reaction ranges from strongly acid to mildly alkaline in the solum and from medium acid to mildy alkaline in the C horizon.

The Ap horizon is 6 to 10 inches thick. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 2 or 3.

The B horizon ranges from 20 to 50 inches in total thickness. It has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam or light silty clay loam.

The C horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 4. In some pedons the C horizon is weakly stratified with loam, silty clay loam, and silt loam.

Lowell series

The Lowell series consists of deep, well drained soils that are moderately slowly permeable. These soils formed in clayey residuum of interbedded limestone and shale. They occur mainly on fairly broad ridges and along heads of drainageways. Slopes range from 2 to 12 percent.

Lowell soils are associated on the landscape with Faywood, McAfee, and Maury soils. Faywood and McAfee are only moderately deep over hard rock. Maury soils have reddish colors and are more permeable than Lowell soils.

Typical pedon of Lowell silt loam in an area of Lowell silt loam, 6 to 12 percent slopes, in a pasture, three-fourths of a mile west of U.S. Highway 68, and one-half mile north of intersection of U.S. Highway 68 and Kentucky Highway 169, Jessamine County:

Ap—0 to 11 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; very friable; many small roots; ped surfaces slightly darker than interiors; slightly acid; clear smooth boundary.

B1t—11 to 16 inches; strong brown (7.5YR 5/6) silty clay; weak medium subangular blocky structure; firm; common fine roots; common clay films; few small black concretions; brown (10YR 4/3) silt loam in some root channels and surrounding some peds in the upper half; slightly acid; clear smooth boundary.

B21t—16 to 23 inches; strong brown (7.5YR 5/6) clay; moderate fine and medium angular blocky structure; very firm; few fine roots; few small pores; many clay films; few small black concretions; few small sand size chert; medium acid; gradual smooth boundary.

B22t—23 to 41 inches; strong brown (7.5YR 5/6) clay; many fine faint brown (10YR 5/3) and yellowish red (5YR 4/6) mottles; common medium distinct light brownish gray (10YR 6/2) mottles in the lower half; moderate fine angular blocky structure parting to fine and very fine angular blocky; very firm; few fine roots; few very small pores; many clay films; few small yellowish sand size chert; 5 percent limestone fragments up to 2 inches across in the lower part; few small black concretions; strongly acid; clear smooth boundary.

B3t—41 to 53 inches; mottled yellowish brown (10YR 5/6) and light gray (10YR 6/2) clay; massive to weak fine and very fine angular blocky structure; very firm; few fine roots; few clay films; many soft black accumulations; 5 percent limestone fragments up to 6 inches across; few small yellowish sand size chert; slightly acid; abrupt smooth boundary.

R—53 inches; hard light gray limestone.

Solum thickness ranges from 30 to 60 inches. Depth to limestone or interbedded limestone, shale, and siltstone ranges from 40 to 80 inches or more. Unless limed, the soil ranges from slightly acid to very strongly acid to a depth of about 23 inches. Below 30 inches it ranges from strongly acid to mildly alkaline except for the layer directly above bedrock, which ranges from medium acid to mildly alkaline. Content of fragments of limestone or siltstone ranges from 0 to 5 percent in the upper part of the solum, from 0 to 15 percent in the lower part, and from 1 to 50 percent in the C horizon.

The Ap horizon is 6 to 12 inches thick. It has hue of 7.5YR or 10YR and chroma of 2 through 4. Texture is silt loam or silty clay loam.

The B1 horizon is 0 to 8 inches thick. It has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 3

through 6. Texture is heavy silt loam, silty clay loam, or silty clay.

The B2t horizon is 20 to 30 inches thick. It has hue of 7.5YR and 10YR in the upper half and 7.5YR, 10YR, and 2.5Y in the lower half, value of 4 or 5, and chroma of 4 or 6. Most pedons are mottled with gray, brown, or red in the lower part. Texture ranges from silty clay loam to clay in the upper part and is silty clay or clay in the lower part.

The B3 horizon is 0 to 20 inches thick. It has hue of 10YR, 2.5Y, and 5Y and chroma of 3 or 6. Mottles are in shades of gray and brown. Texture is heavy silty clay loam, silty clay, or clay.

In some pedons the C horizon has colors and textures like those of the B3 horizon. In others, matrix colors are in shades of gray.

Maury series

The Maury series consists of deep, well drained soils that are moderately to moderately rapidly permeable. These soils formed in a thin mantle of silt and in underlying material weathered from phosphatic limestone. They occur mainly along broad ridges in the northern and central parts of the survey area. Some karst topography and sinks occur. Slopes range from 0 to 12 percent.

Maury soils are geographically associated with McAfee, Donerail, Lowell, and Faywood soils. McAfee, Donerail, Lowell, and Faywood soils have a solum less than 60 inches thick. Donerail is only moderately well drained. McAfee and Faywood soils have lithic contact at less than 40 inches. Lowell soils have a B horizon that is brown or yellow.

Typical pedon of Maury silt loam in an area of Maury silt loam, 2 to 6 percent slopes, about 800 feet west of Stuls Road, 1 1/4 miles northeast of intersection of U.S. Highway 60 and Stuls Road, and 4 1/4 miles north of Versailles, Woodford County:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; very friable; many fine roots; neutral; clear smooth boundary.

B1—9 to 16 inches; brown (7.5YR 4/4) heavy silt loam; weak medium subangular and weak fine granular structure; friable; many fine roots; few small pores; few small black concretions; strongly acid; clear smooth boundary.

B21t—16 to 27 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular parting to weak very fine angular blocky structure; friable; few fine roots; few fine pores; common clay films; few small black concretions; strongly acid; clear smooth boundary.

B22t—27 to 38 inches; yellowish red (5YR 5/6) silty clay; moderate medium angular blocky structure; friable; few fine roots; few fine pores; many clay films; common small black concretions; few black coatings on peds; strongly acid; gradual smooth boundary.

B23t—38 to 54 inches; yellowish red (5YR 5/6) silty clay; few fine distinct yellowish brown (10YR 5/6) mottles and few medium distinct light yellowish brown (10YR 6/4) mottles below 46 inches; moderate medium angular blocky structure parting to weak fine blocky structure; friable; few fine roots; few fine pores; many clay films; common small black concretions; few black coatings on peds; strongly acid; gradual smooth boundary.

B24t—54 to 80 inches; yellowish red (5YR 5/6) clay; common medium faint light brownish gray (10YR 6/2) and brown (10YR 5/3) mottles; weak coarse angular blocky structure; very firm; few black concretions; few black coatings on ped faces; strongly acid; gradual smooth boundary.

C—80 to 96 inches; dark brown (7.5YR 5/6) clay; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium and coarse angular blocky structure; very firm; common soft black concretions; medium acid.

Solum thickness ranges from 60 to about 120 inches. Thickness of the argillic horizon ranges from about 50 to 100 inches. Depth to bedrock ranges from 60 to 200 inches or more. The content of chert fragments less than 3 inches in diameter ranges from 0 to 5 percent in the B2t and C horizons. Reaction ranges from neutral to strongly acid in the A horizon, from slightly acid to strongly acid in the upper part of the B horizon, and from medium acid to very strongly acid in the lower part of the B horizon.

The Ap horizon is 5 to 10 inches thick. It has hue of 10YR or 7.5YR and chroma of 3 or 4.

The B1 horizon is 4 to 9 inches thick. It has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 3 or 4. Texture is heavy silt loam or silty clay loam.

The B2t horizon is 50 to 100 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silty clay loam, silty clay, or clay in the upper part and silty clay or clay in the lower part.

The C horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 through 8. It is silty clay or clay.

McAfee series

The McAfee series consists of moderately deep, well drained soils that are moderately slowly permeable. These soils formed in clayey material weathered from phosphatic limestone. They occur throughout most of the survey area, mainly on landforms that are rolling to strongly sloping. Karst topography and sinks are fairly common. Slopes range from 2 to 20 percent.

McAfee soils are associated geographically with Maury, Donerail, Lowell, and Faywood soils. Maury, Donerail, and Lowell soils are deep over hard rock. Faywood soils have a light colored A horizon and yellowish brown B horizon.

Typical pedon of McAfee silt loam in an area of McAfee silt loam, 6 to 12 percent slopes, along road to Jessamine

County Childrens' Home, about three-fourths of a mile south of intersection with Maple Street, Nicholasville:

Ap—0 to 7 inches; dark brown (10YR 3/3) heavy silt loam, brown (10YR 5/3) when dry; moderate fine granular structure; friable; many fine roots; slightly acid; clear smooth boundary.

B21t—7 to 15 inches; brown (7.5YR 4/4) heavy silty clay loam; moderate fine subangular blocky structure; firm; many fine roots; common clay films; few 1/2 to 2 millimeters black concretions; slightly acid; gradual smooth boundary.

B22t—15 to 25 inches; reddish brown (5YR 4/4) silty clay; moderate medium subangular blocky structure; very firm; common fine roots; many clay films; few 1/2 to 2 millimeters black concretions; 2 percent small white fragments of chert; medium acid; gradual smooth boundary.

C—25 to 30 inches; dark reddish brown (5YR 3/3) clay; massive; extremely firm; few 1/2 to 2 millimeters black concretions; 5 percent small white fragments of chert; neutral; abrupt smooth boundary.

R—30 inches; limestone bedrock, hard and level bedded.

Solum thickness and depth to limestone bedrock range from 20 to 40 inches. Reaction ranges from medium acid to neutral in the solum and from slightly acid to mildly alkaline in the C horizon. The content of chert fragments 2 millimeters to 3 inches across and limestone fragments 1 to 6 inches across ranges from 0 to 15 percent in the solum and from 0 to 25 percent in the C horizon.

The Ap horizon is 6 to 10 inches thick. It has hue of 10YR through 5YR, value of 3, and chroma of 2 through 4. Texture is silt loam or silty clay loam.

The B21t horizon is 0 to 20 inches thick. It has hue of 7.5YR and 5YR, value of 4, and chroma of 3, 4, or 6. Texture is heavy silty clay loam, silty clay, or clay.

The B22t horizon is 10 to 20 inches thick. It has hue of 7.5YR and 5YR, value of 3 or 4, and chroma of 3, 4, or 6. Texture is heavy silty clay loam, silty clay, or clay.

In some pedons the B3t horizon is up to 10 inches thick. Colors are like that of the B22t horizon. Texture is silty clay or clay. Some pedons also have mottles in shades of brown or red.

The C horizon has colors like those of the B22t horizon. In some pedons it is mottled in shades of gray, brown, or red. Texture is silty clay or clay. Some pedons do not have a C horizon.

Melvin series

The Melvin series consists of deep, poorly drained soils that are moderately permeable. These soils formed in material washed mainly from soils of limestone origin. Melvin soils occur principally along Sinking Creek in Jessamine County. Slopes are 0 to about 2 percent.

Melvin soils are associated on the landscape with Dunning, Lindside, and Newark soils. Dunning soils have a dark A horizon and are finer textured than Melvin soils. Lindside and Newark soils are better drained.

Typical pedon of Melvin silt loam in an area of Melvin silt loam on Sinking Creek, about 0.4 mile north of blacktop road, 0.5 mile west of Highway 1267, and 1.5 miles south of Fayette County line, in Jessamine County:

Ap—0 to 8 inches; dark grayish brown (2.5Y 4/2) silt loam; common fine mottles of yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2); weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

B2g—8 to 22 inches; gray (10YR 5/1) silt loam; common fine distinct mottles of dark brown (10YR 3/3), yellowish brown (10YR 5/6), and reddish brown (5YR 4/4); weak fine granular and subangular blocky structure; friable; common fine roots; 2 percent 1 to 2 millimeters manganese concretions; slightly acid; clear smooth boundary.

Cg—22 to 60 inches; mottled light gray (10YR 6/1), light brownish gray (2.5Y 6/2), pale olive (5Y 6/4), and strong brown (7.5YR 5/6) light silty clay loam; structureless; friable; very few fine roots in upper 15 inches; 2 percent 1 to 2 millimeters manganese concretions; slightly acid.

Thickness of the solum is 20 to 40 inches. Depth to bedrock is 60 to more than 200 inches. Content of coarse fragments ranges from 0 to 5 percent to a depth of 30 inches and up to 15 percent below 30 inches. Content of concretions is 0 to 2 percent throughout the profile. Reaction ranges from slightly acid to mildly alkaline throughout the profile.

The Ap horizon is 5 to 10 inches thick. It has hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 1 or 2.

The B2g horizon is 10 to 30 inches thick. It has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 1 or 2. Mottles are in shades of brown, olive, or gray. Texture is silt loam and light silty clay loam.

The C horizon has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 1 or 2. Mottles are in shades of brown, olive, or gray. Texture is silt loam or light silty clay loam.

Newark series

The Newark series consists of deep, somewhat poorly drained soils that are moderately permeable. These soils formed in alluvium washed from soils derived from limestone. They occur on flood plains throughout the survey area. Slopes are 0 to 2 percent.

Newark soils are associated geographically with Melvin, Dunning, and Lindside soils. Melvin soils are poorly drained, Dunning soils are very poorly drained, and Lindside soils are moderately well drained. Dunning soils are finer textured than Newark.

Typical pedon of Newark silt loam in an area of Newark silt loam, on Sinking Creek, one-half mile downstream

from Keene Military Pike bridge, 1 mile south of Fayette County line, and 4 miles north of Keene, Jessamine County:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

B21—10 to 18 inches; brown (10YR 5/3) silt loam; many fine and medium faint grayish brown (10YR 5/2) mottles; weak fine granular structure; very friable; few fine roots; medium acid; smooth boundary.

B22g—18 to 42 inches; light brownish gray (10YR 6/2) silt loam; many fine and medium faint dark grayish brown (10YR 4/2) and few fine distinct strong brown (7.5YR 5/8) mottles; weak fine granular structure; very friable; medium acid; gradual smooth boundary.

Cg—42 to 60 inches; mottled light brownish gray (10YR 6/2), gray (10YR 5/1), yellowish brown (10YR 5/8), and brown (10YR 5/3) heavy silt loam; massive; friable; soft black concretionary material common; medium acid.

Solum thickness ranges from 22 to 44 inches. Reaction ranges from medium acid to mildly alkaline throughout the profile.

The Ap horizon is 6 to 10 inches thick. It has hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 2 through 4.

The B21 horizon is 4 to 10 inches thick. It has matrix colors in hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 2 through 4. Mottles are in shades of brown or gray. Texture is silt loam or light silty clay loam.

The B22g horizon is 5 to 30 inches thick. It has matrix colors in hue of 2.5Y through 7.5YR, value of 4 through 7, and chroma of 1 or 2. Mottles are in shades of brown and range from few to many. Texture is silt loam to light silty clay loam.

The Cg horizon has matrix colors in shades of gray or mottled without dominant color. Texture is silt loam or light silty clay loam.

Formation of the soils

This part of the survey describes the factors of soil formation and relates them to the soils of the survey area. It also explains the processes of soil formation.

The characteristics of the soil at any given point depend on the climate, the physical and chemical composition of parent material, the relief, the plant and animal life, and the length of time needed to change the parent material into soil. Soil is formed by the interaction of these five factors. The relative importance of each factor differs from one area to another. In some areas one factor may dominate in the formation of soil characteristics, and in other areas another factor may dominate. Climate and plant and animal life are not likely to vary much within a county, but there may be many local differences in relief and parent material.

Climate.—Climate affects the physical, chemical, and biological relationships in the soil. It influences the kind and number of plants and animals, the weathering of rocks and minerals, the rate of erosion, and the rate of soil formation.

The soils in Jessamine and Woodford Counties formed in a temperate moist climate. Because the soils were moist and subject to leaching during formation, the soluble bases were largely leached out of the solum and clay minerals were moved from the surface layer into the subsoil. As a result, many of these soils are acid and have a high content of clay in the subsoil. The Maury and Lowell soils are examples. Climate has been a relatively uniform factor and accounts for only very slight differences among the soils.

Parent material.—Parent material is the unconsolidated mass from which the soil forms. The soils in Jessamine and Woodford Counties formed mostly in material weathered from rocks in place and in alluvium washed from these soils and deposited along the streams. Most of the parent material weathered from rock formations consisting primarily of limestone. Some rock formations, however, especially in the northwestern part of Woodford County and in the west-central and the extreme northwestern parts of Jessamine County, are interbedded with thin layers of calcareous shale. The parent material of the soils in the southeastern part of Jessamine County weathered from calcareous siltstone, calcareous shale, and limestone.

The chemical composition, the mineral content, and the texture of the soils have been influenced by the kind of parent material from which the soils formed. Culleoka soils, which formed in material weathered from siltstone, are coarser textured than Lowell soils, which formed in material weathered principally from limestone and shale. Maury and McAfee soils, which formed in material weathered from phosphatic limestone, are medium to high in phosphate.

Relief.—Relief influences the formation of soils through its effect on drainage, erosion, plant cover, and soil temperature.

The two counties are dominantly broad, gently rolling, or undulating areas that are underlain by limestone. Soils formed on this type of relief show more clearly the influence of all soil-forming factors. Runoff is moderate. Unless erosion is excessive, a normal soil profile can be developed. Maury and Lowell soils are examples.

Steep soils tend to be shallow and to show less development because geologic erosion is rapid and little water infiltrates and percolates through the soil. Fairmount and Eden soils are examples.

Living organisms.—Plants and animals are important in the formation of soils. Living organisms affect the organic matter, plant-nutrient content, and soil texture. The soils that formed under grass normally have a thicker and

darker surface layer than the soils that formed under forest. In places, Maury soils have a thicker and somewhat darker colored surface layer than is normal for soils formed under forest. Dunning soils have a thick dark colored surface layer that is dominantly an accumulation of organic matter. They formed under dense marsh vegetation where oxidation was restricted.

Time —The length of time that the processes of soil formation have been in progress is reflected in the degree of development of the soil profile. A young soil has very little horizon development, and mature soil has well expressed soil horizons.

Huntington soils, which formed in recently deposited alluvium on flood plains and have little horizon development, are examples of young soils. Lowell and Maury soils, which formed in residuum on gently sloping uplands and have clearly defined horizons, are examples of mature soils.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	Less than 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Channery soil. A soil, that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Drainage, surface. Runoff, or surface flow of water, from an area.

Chert. An angular fragment of rock, less than 3 inches in diameter.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Erosion pavement. A layer of gravel or stones that remains on the ground surface after fine particles are removed by wind or water. Desert pavements result from wind erosion in arid areas.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Foot slope. The inclined surface at the base of a hill.

Frost action. Freezing and thawing of soil moisture. Frost action can damage structures and plant roots.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Hummocky. Refers to a landscape of hillocks, separated by low sags, having sharply rounded tops and steep sides. Hummocky relief resembles rolling or undulating relief, but the tops of ridges are narrower and the sides are shorter and less even.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differencees are too small to justify separate series.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Range (or rangeland). Land that, for the most part, produces native plants suitable for grazing by livestock; includes land supporting some forest trees.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline-alkali soil. A soil that contains a harmful concentration of salts and exchangeable sodium; contains harmful salts and is strongly alkaline; or contains harmful salts and exchangeable sodium and is very strongly alkaline. The salts, exchangeable sodium, and alkaline reaction are in the soil in such location that growth of most crop plants is less than normal.

Stone line. A concentration of coarse fragments in soils that generally marks an old weathering surface. In a cross section, the line may be one fragment or more thick. The line generally overlies material that weathered in place and marks the top of a paleosol. It is ordinarily overlain by recent sediment of variable thickness.

Stubble mulch. Stubble or other crop residue left on the soil, or partly worked into the soil, to provide protection from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. A term used in nontechnology soil descriptions for one or more layers above the subsoil. Includes A horizon and part of B horizon; has no depth limit.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Unstable fill. Risk of caving or sloughing in banks of fill material.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

ILLUSTRATIONS

Figure 1.—Red clover and orchardgrass in foreground, grassed waterway in center, corn and burley tobacco in background. The soil is Maury silt loam, 2 to 6 percent slopes.

Figure 2.—Kentucky bluegrass pasture. The soil is Maury silt loam, 2 to 6 percent slopes.

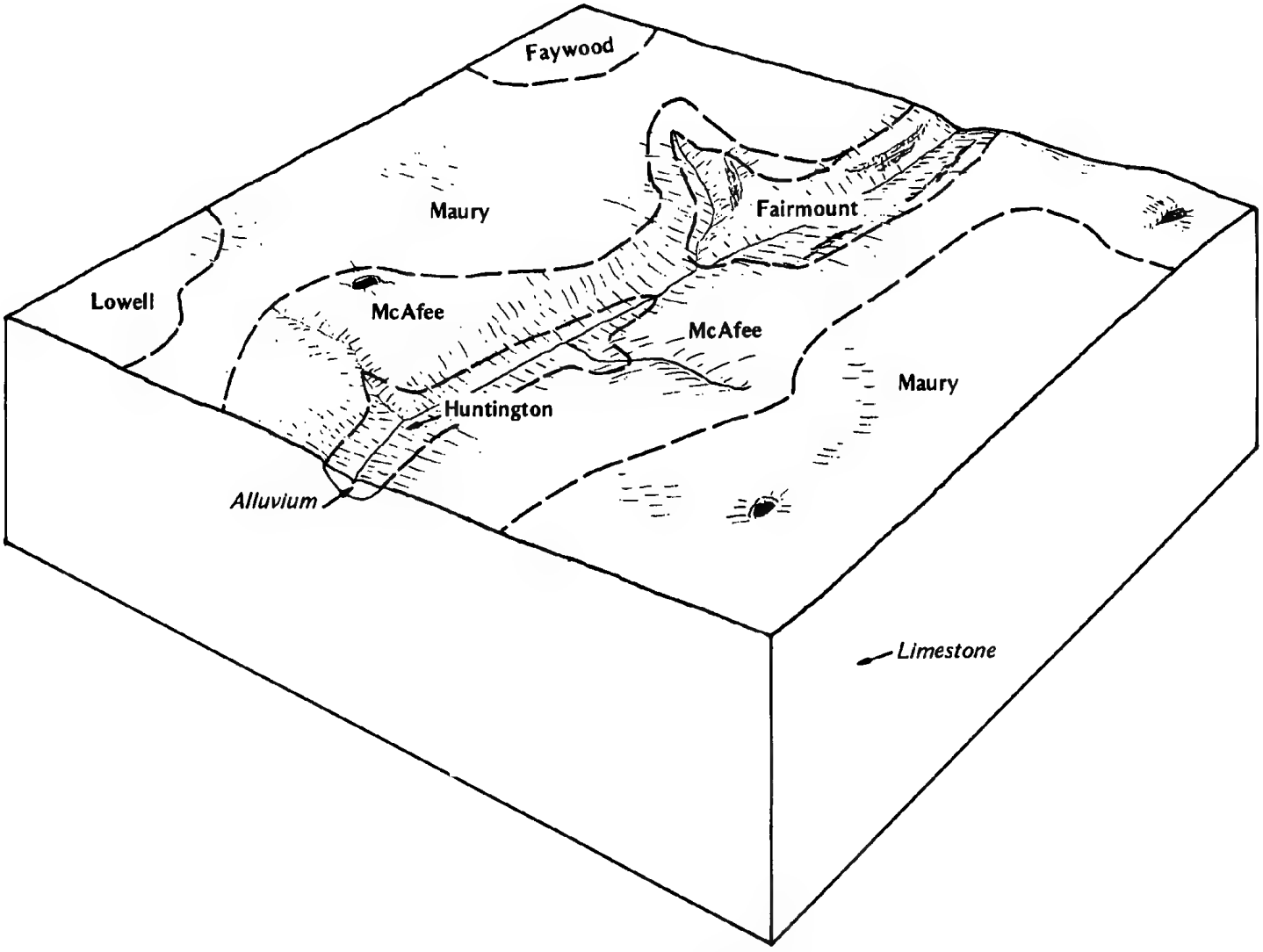

Figure 3.—Pattern of soils and underlying material in Maury-McAfee unit.

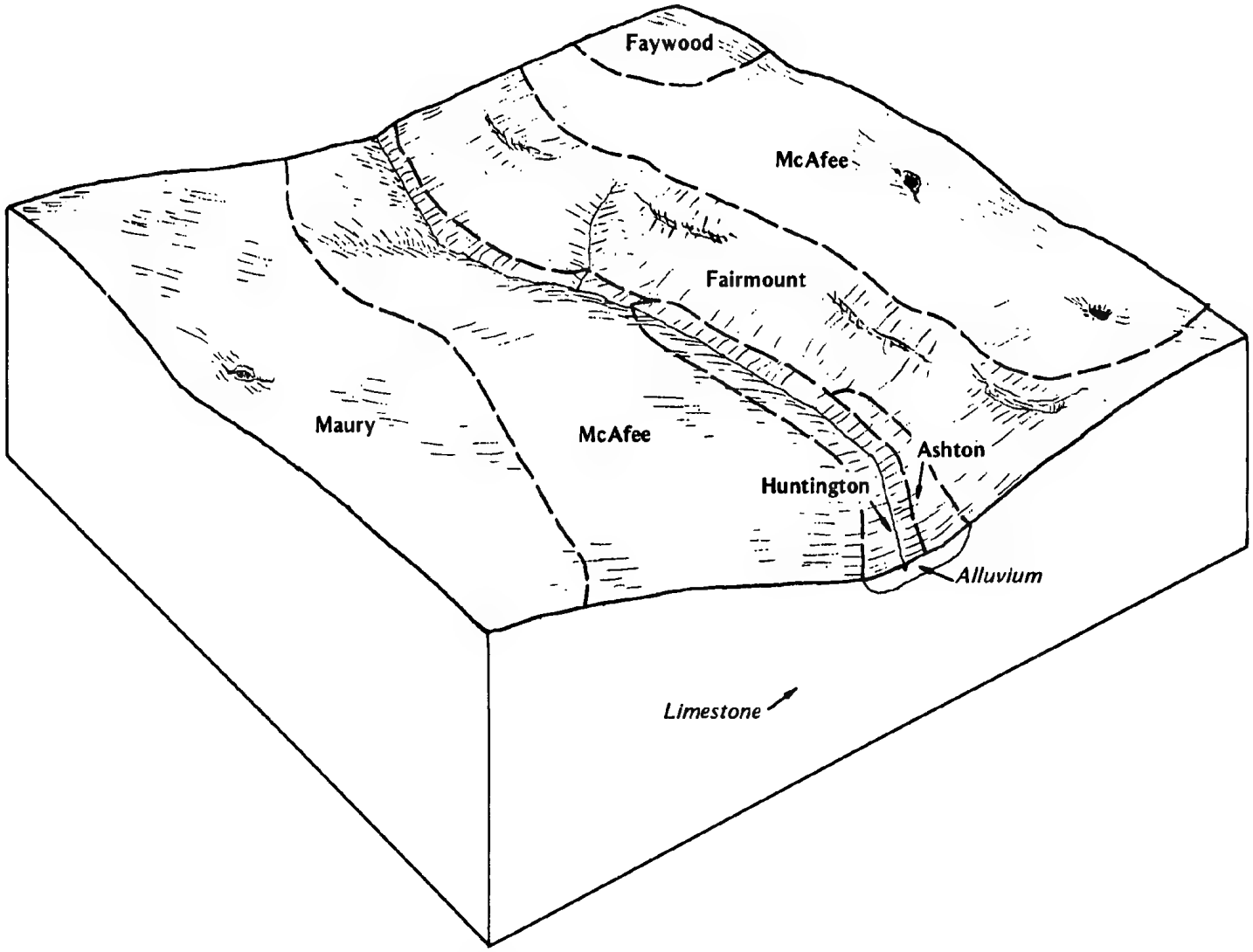

Figure 4.—Pattern of soils and underlying material in McAfee-Maury-Fairmount unit.

Figure 5.—Palisades on Fairmount-Rock outcrop unit along the Kentucky River. Woodland provides food and cover for wildlife.

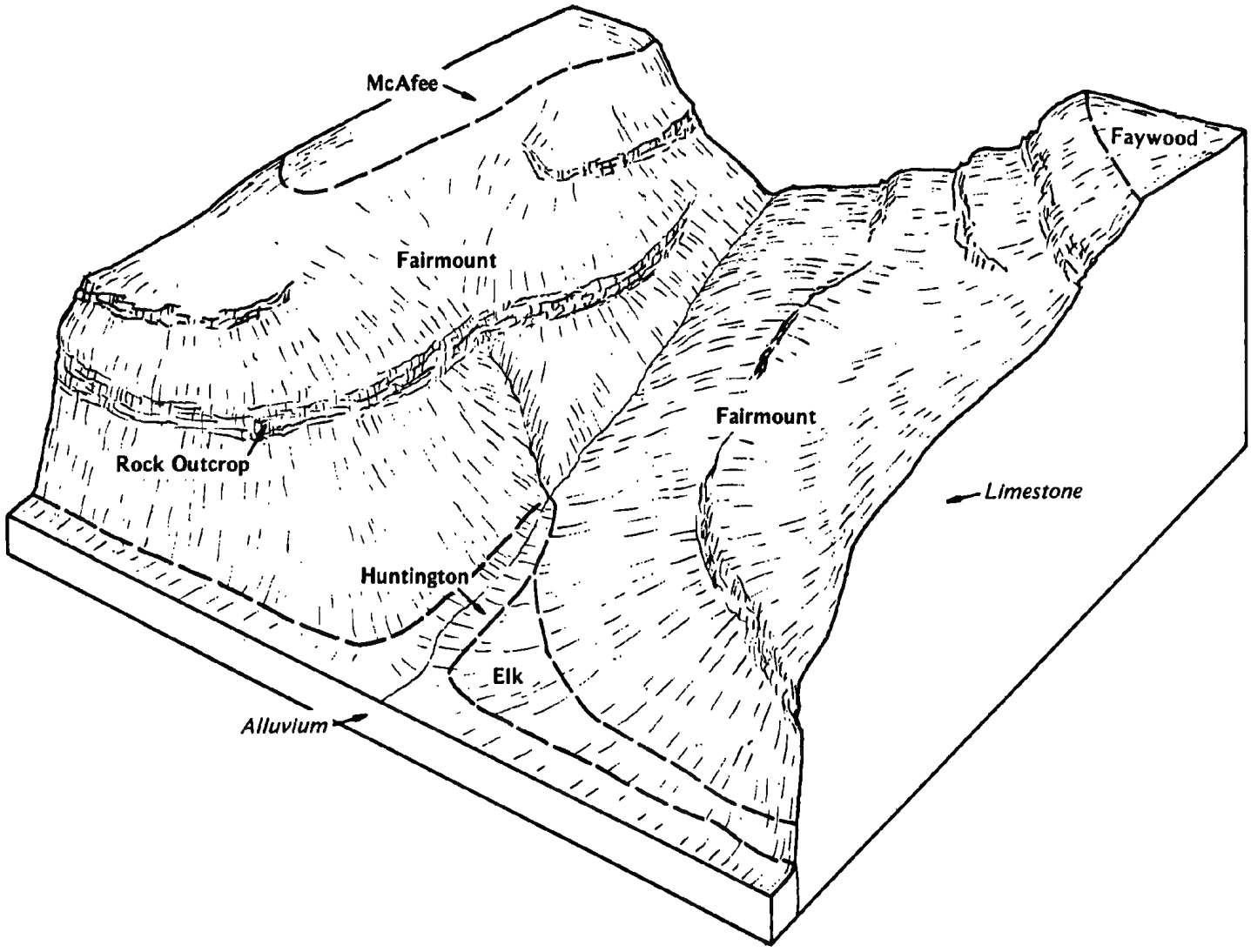

Figure 6.—Pattern of soils and underlying material in Fairmount-Rock outcrop unit.

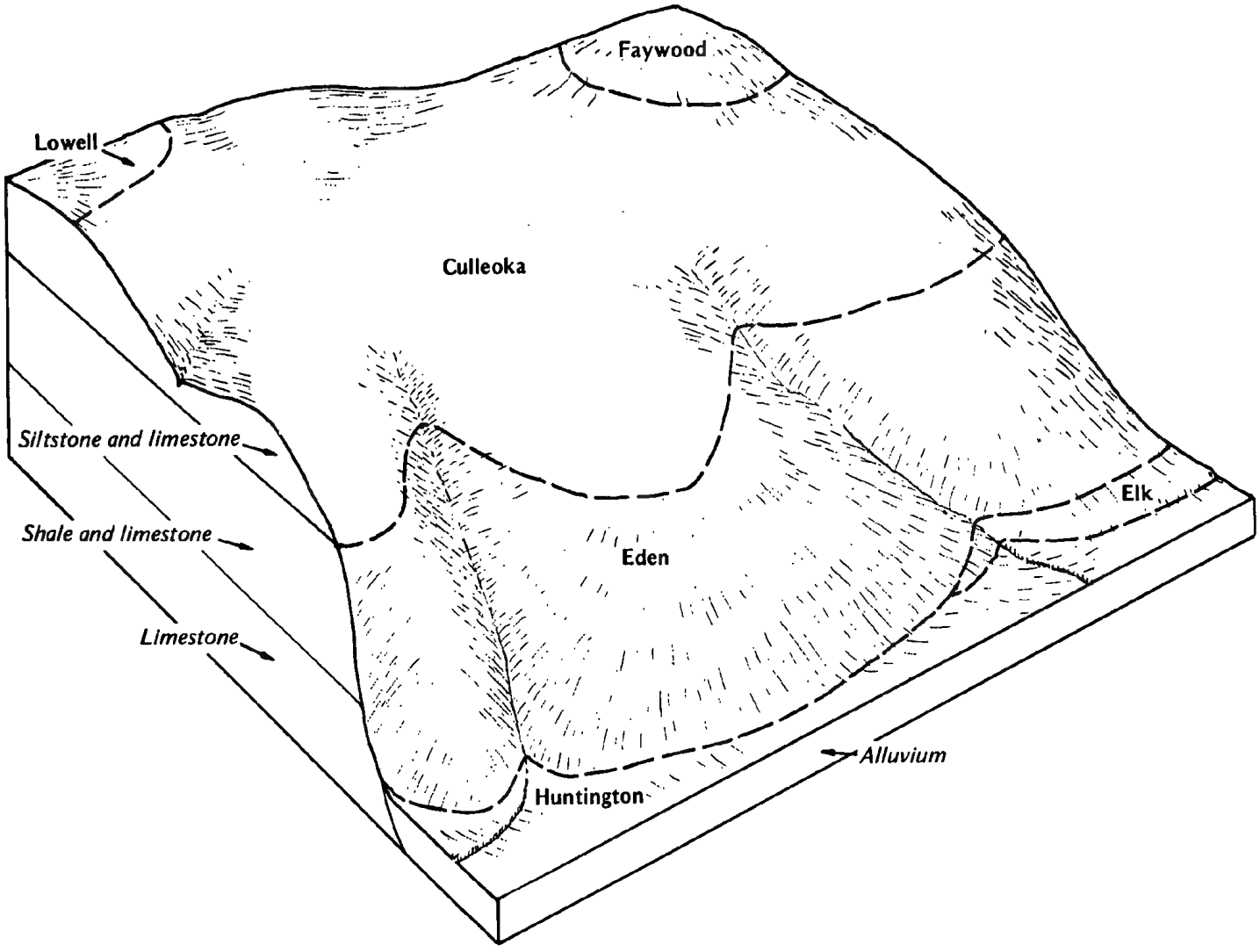

Figure 7.—Pattern of soils and underlying material in Eden-Culleoka unit.

Figure 8.—Kentucky 31 tall fescue and lespedeza pasture on Eden silty clay loam, 12 to 20 percent slopes.

Figure 9.—Low quality pasture and trees on Fairmount-Rock outcrop complex, 12 to 30 percent slopes.

Figure 10.—Harvesting contoured strips of burley tobacco. The soil is Maury silt loam, 2 to 6 percent slopes.

Figure 11.—Spring fed water tank in Kentucky bluegrass pasture. The soil is Maury silt loam, 6 to 12 percent slopes.

Figure 12.—Kentucky bluegrass pasture on McAfee silt loam, 6 to 12 percent slopes. Karst topography and sinkholes are common on McAfee soils.

Figure 13.—Low quality pasture on McAfee-Rock outcrop complex, 6 to 20 percent slopes.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	F	F	F	F	F	Units	In	In	In		In
January----	41.1	24.2	32.6	68	-8	7	3.56	1.86	4.93	7	5.1
February---	44.3	25.9	35.1	70	-2	11	3.40	1.81	4.69	7	5.2
March------	53.4	33.7	43.6	80	13	74	4.77	2.46	6.65	8	3.1
April------	65.8	44.3	55.1	85	25	186	4.11	2.34	5.54	7	.2
May--------	74.9	53.4	64.2	91	32	445	4.48	2.82	5.96	8	.0
June-------	82.7	61.8	72.3	95	46	669	4.61	2.91	6.14	8	.0
July-------	85.9	65.9	75.9	96	52	803	4.74	2.85	6.42	7	.0
August-----	85.2	64.4	74.8	96	50	769	3.64	2.21	4.91	6	.0
September--	79.7	58.1	68.9	94	38	567	2.90	1.28	4.22	5	.0
October----	68.3	46.4	57.4	87	26	260	1.95	.99	2.73	4	.0
November---	54.0	35.5	44.8	78	12	18	3.42	2.15	4.55	6	1.3
December---	44.5	28.1	36.3	70	1	19	3.73	1.98	5.15	7	2.8
Year-----	65.0	45.1	55.1	98	-10	3,828	45.31	39.35	51.02	80	17.7

[1]Recorded in the period 1951-74 at Lexington, Ky.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 7	April 20	May 4
2 years in 10 later than--	April 2	April 15	April 28
5 years in 10 later than--	March 22	April 5	April 18
First freezing temperature in fall:			
1 year in 10 earlier than--	October 29	October 16	October 11
2 years in 10 earlier than--	November 2	October 21	October 16
5 years in 10 earlier than--	November 10	October 31	October 24

[1]Recorded in the period 1951-74 at Lexington, Ky.

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24 F	Higher than 28 F	Higher than 32 F
	Days	Days	Days
9 years in 10	217	188	170
8 years in 10	222	195	176
5 years in 10	232	209	189
2 years in 10	242	222	201
1 year in 10	247	230	207

[1]Recorded in the period 1951-74 at Lexington, Ky.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Jessamine County	Woodford County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
AsA	Ashton silt loam, 0 to 2 percent slopes	290	120	410	0.2
AsB	Ashton silt loam, 2 to 6 percent slopes	1,160	1,410	2,570	1.1
Bn	Boonesboro silt loam	950	460	1,410	0.6
CcC	Culleoka silt loam, 6 to 12 percent slopes	880	0	880	0.4
CcD	Culleoka silt loam, 12 to 20 percent slopes	490	0	490	0.2
CfE	Culleoka flaggy silt loam, 20 to 30 percent slopes	2,620	0	2,620	1.1
DoB	Donerail silt loam, 2 to 6 percent slopes	1,790	2,050	3,840	1.6
Du	Dunning silty clay loam	620	720	1,340	0.6
EdC	Eden silty clay loam, 6 to 12 percent slopes	620	110	730	0.3
EdD	Eden silty clay loam, 12 to 20 percent slopes	1,140	240	1,380	0.6
EfE	Eden flaggy silty clay, 20 to 30 percent slopes	1,890	210	2,100	0.9
EfF	Eden flaggy silty clay, 30 to 50 percent slopes	2,500	0	2,500	1.1
ElB	Elk silt loam, 2 to 6 percent slopes	720	1,170	1,890	0.8
ElC	Elk silt loam, 6 to 12 percent slopes	550	180	730	0.3
ElD	Elk silt loam, 12 to 20 percent slopes	250	80	330	0.1
EvB	Elk Variant silt loam, 2 to 6 percent slopes	500	1,250	1,750	0.7
FaC	Fairmount flaggy silty clay, 6 to 12 percent slopes	5,940	3,410	9,350	3.9
FcE	Fairmount-Rock outcrop complex, 12 to 30 percent slopes	3,770	5,620	9,390	4.0
FcF	Fairmount-Rock outcrop complex, 30 to 60 percent slopes	4,780	4,200	8,980	3.8
FdB	Faywood silt loam, 2 to 6 percent slopes	1,010	880	1,890	0.8
FdC	Faywood silt loam, 6 to 12 percent slopes	1,900	5,710	7,610	3.2
FdE	Faywood silt loam, 12 to 30 percent slopes	1,920	2,890	4,810	2.0
Hu	Huntington silt loam	4,690	5,700	10,390	4.4
Lc	Lawrence silt loam	210	270	480	0.2
Ld	Lindside silt loam	1,060	880	1,940	0.8
LwB	Lowell silt loam, 2 to 6 percent slopes	3,060	4,570	7,630	3.2
LwC	Lowell silt loam, 6 to 12 percent slopes	1,750	4,360	6,110	2.6
MlA	Maury silt loam, 0 to 2 percent slopes	400	430	830	0.3
MlB	Maury silt loam, 2 to 6 percent slopes	19,910	34,620	54,530	23.0
MlC	Maury silt loam, 6 to 12 percent slopes	5,810	13,520	19,330	8.2
MnB	McAfee silt loam, 2 to 6 percent slopes	12,460	3,440	15,900	6.7
MnC	McAfee silt loam, 6 to 12 percent slopes	21,210	16,810	38,020	16.1
MnD	McAfee silt loam, 12 to 20 percent slopes	3,000	5,240	8,240	3.5
MoC3	McAfee silty clay, 6 to 12 percent slopes, severely eroded	540	500	1,040	0.4
MrD	McAfee-Rock outcrop complex, 6 to 20 percent slopes	1,920	1,620	3,540	1.5
Mt	Melvin silt loam	310	90	400	0.2
Ne	Newark silt loam	660	760	1,420	0.6
	Total	113,280	123,520	236,800	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Tobacco	Corn	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Lb	Bu	Bu	Bu	Ton	Ton	AUM*
AsA---- Ashton	3,200	150	50	45	5.5	4.5	9.5
AsB---- Ashton	3,200	130	45	40	5.5	4.5	9.5
Bn---- Boonesboro	2,800	100	40	40	---	3.0	5.5
CcC---- Culleoka	2,600	100	40	35	---	3.5	7.0
CcD---- Culleoka	2,000	80	35	25	---	3.0	6.0
CfE---- Culleoka	---	---	---	---	---	2.5	5.0
DoB---- Donerail	2,400	110	40	40	---	4.5	9
Du---- Dunning	---	120	---	45	---	4.0	8.5
EdC---- Eden	2,300	80	30	---	3.0	3.0	6.0
EdD---- Eden	---	---	20	---	2.0	2.5	5.0
EfE---- Eden	---	---	---	---	---	2.0	4.0
EfF---- Eden	---	---	---	---	---	---	---
ElB---- Elk	3,000	115	45	40	4.0	4.0	8.0
ElC---- Elk	2,600	100	40	35	3.0	3.5	7.0
ElD---- Elk	2,200	80	35	30	---	3.0	6.0
EvB---- Elk Variant	3,200	125	50	40	5.0	4.5	9.5
FaC---- Fairmount	---	---	---	---	---	---	4.0
FcE---- Fairmount	---	---	---	---	---	---	3.5
FcF---- Fairmount	---	---	---	---	---	---	2.5
FdB---- Faywood	2,300	90	25	30	4.0	3.5	6.5
FdC---- Faywood	2,000	80	20	25	3.5	3.0	5.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Tobacco	Corn	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Lb	Bu	Bu	Bu	Ton	Ton	AUM*
FdE---------- Faywood	---	---	---	---	---	2.5	5.0
Hu---------- Huntington	2,900	140	45	40	4.5	4.5	9.0
Lc---------- Lawrence	1,700	80	---	35	---	3.0	6.0
Ld---------- Lindside	2,700	140	45	45	4.0	4.5	9.0
LwB---------- Lowell	2,900	110	40	35	5.0	4.0	8.0
LwC---------- Lowell	2,600	100	35	30	5.0	4.0	8.0
MlA---------- Maury	3,200	135	50	45	5.5	4.5	9.5
MlB---------- Maury	3,200	125	50	40	5.5	4.5	9.5
MlC---------- Maury	3,000	115	45	35	5.0	4.0	8.5
MnB---------- McAfee	2,600	100	30	35	4.5	3.5	7.0
MnC---------- McAfee	2,200	95	25	30	4.0	3.5	6.5
MnD---------- McAfee	---	60	---	---	3.0	3.0	6.0
MoC3---------- McAfee	---	60	---	---	3.0	3.0	6.0
MrD---------- McAfee	---	---	---	---	---	2.5	5.0
Mt---------- Melvin	---	90	---	35	---	3.5	7.5
Ne---------- Newark	2,500	100	45	40	---	4.5	8.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas excluded. Absence of an entry means no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	13,570	---	---	---
II	92,830	90,000	1,420	1,410
III	74,900	72,680	2,220	---
IV	15,640	15,640	---	---
V	---	---	---	---
VI	28,380	15,450	---	12,930
VII	11,480	2,500	---	8,980
VIII	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
AsA, AsB Ashton	1o	Slight	Slight	Slight	Severe	Northern red oak Pin oak Yellow-poplar Sweetgum Shumard oak	85 103 95 77 94	Eastern white pine, yellow-poplar, black walnut, sweetgum, cherrybark oak.
Bn Boonesboro	1o	Slight	Slight	Slight	Severe	Northern red oak	85	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white ash, eastern white pine, shortleaf pine.
CcC Culleoka	2o	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak Loblolly pine Shortleaf pine Eastern redcedar	75 94 77 80 60	Eastern white pine, black walnut, yellow-poplar, shortleaf pine, Virginia pine, black locust.
CcD, CfE Culleoka	2r	Moderate	Moderate	Slight	Severe	Yellow-poplar Northern red oak Loblolly pine Shortleaf pine Eastern redcedar	75 94 77 80 60	Eastern white pine, black walnut, yellow-poplar, shortleaf pine, Virginia pine, black locust.
DoB Donerail	2o	Slight	Slight	Slight	Severe	Northern red oak	80	Yellow-poplar, white ash, black walnut, eastern white pine, shortleaf pine.
Du Dunning	1w	Slight	Severe	Severe	Severe	Pin oak Sweetgum Eastern cottonwood	95 95 100	Loblolly pine, pin oak.
EdC Eden	3c	Moderate	Moderate	Moderate	Moderate	Eastern redcedar	44	Eastern redcedar, Virginia pine, Scotch pine, Austrian pine.
EdD, EfE Eden	3c	Severe	Severe	Moderate	Moderate	Eastern redcedar	44	Eastern redcedar, Virginia pine, Scotch pine, Austrian pine.
EfF Eden	3c	Severe	Severe	Moderate	Moderate	Eastern redcedar	44	Eastern redcedar, Virginia pine, Scotch pine, Austrian pine.
ElB, ElC Elk	2o	Slight	Slight	Slight	Severe	Northern red oak Yellow-poplar Shortleaf pine Eastern white pine	80 90 80 90	Eastern white pine, yellow-poplar, black walnut, shortleaf pine.
ElD Elk	2r	Moderate	Moderate	Slight	Severe	Northern red oak Yellow-poplar Shortleaf pine Eastern white pine	80 90 80 90	Eastern white pine, yellow-poplar, black walnut, shortleaf pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
EvB---------- Elk Variant	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Black walnut, yellow-poplar, white ash, black locust, eastern white pine, shortleaf pine.
FaC---------- Fairmount	4d	Moderate	Moderate	Severe	Slight	Northern red oak---- Virginia pine------- Eastern redcedar----	60 60 42	Eastern redcedar, Virginia pine.
FcE*, FcF*--------- Fairmount	4d	Severe	Severe	Severe	Slight	Northern red oak---- Virginia pine------- Eastern redcedar----	60 60 42	Eastern redcedar, Virginia pine.
Rock outcrop.								
FdB, FdC---------- Faywood	3c	Slight	Slight	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine-------	70 70 70	Shortleaf pine, loblolly pine, eastern white pine, black locust, eastern redcedar.
FdE---------- Faywood	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine-------	70 70 70	Shortleaf pine, loblolly pine, eastern white pine, black locust, eastern redcedar.
Hu---------- Huntington	1o	Slight	Slight	Slight	Severe	Yellow-poplar------- Northern red oak----	95 85	Yellow-poplar, black walnut, black locust, eastern white pine.
Lc---------- Lawrence	2w	Slight	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar------- Sweetgum---------- Shortleaf pine------	65 90 87 69	Yellow-poplar, white ash, loblolly pine, American sycamore.
Ld---------- Lindside	1w	Slight	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar------- White oak----------	85 95 85	Eastern white pine, yellow-poplar, black walnut, sweetgum, white ash.
LwB, LwC---------- Lowell	3c	Slight	Moderate	Slight	Moderate	Northern red oak---- Yellow-poplar------- Shortleaf pine------ Virginia pine-------	70 90 80 80	Yellow-poplar, eastern white pine, shortleaf pine, Virginia pine, loblolly pine.
MlA, MlB, MlC------ Maury	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Black walnut, yellow-poplar, white ash, black locust, eastern white pine, shortleaf pine.
MnB, MnC---------- McAfee	3c	Slight	Slight	Slight	Moderate	Northern red oak---- Eastern redcedar---- Yellow-poplar-------	79 50 85	Eastern redcedar, eastern white pine, yellow-poplar, black walnut, black locust, shortleaf pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
MnD---------- McAfee	3c	Moderate	Moderate	Slight	Moderate	Northern red oak---- Eastern redcedar---- Yellow-poplar-------	79 50 85	Eastern redcedar, eastern white pine, yellow-poplar, black walnut, black locust, shortleaf pine.
MoC3---------- McAfee	4c	Slight	Slight	Slight	Slight	Northern red oak----	60	Virginia pine, eastern redcedar.
MrD*---------- McAfee Rock outcrop.	3c	Slight	Moderate	Slight	Moderate	Northern red oak---- Eastern redcedar---- Yellow-poplar-------	79 50 85	Eastern redcedar, eastern white pine, yellow-poplar, black walnut, black locust, shortleaf pine.
Mt---------- Melvin	1w	Slight	Severe	Severe	Severe	Pin oak----------	101	Pin oak, American sycamore, sweetgum, loblolly pine.
Ne---------- Newark	1w	Slight	Moderate	Slight	Severe	Pin oak---------- Eastern cottonwood-- Northern red oak---- Yellow-poplar------- Sweetgum----------	99 94 85 95 88	Eastern cottonwood, sweetgum, loblolly pine, American sycamore.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AsA, AsB Ashton	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Slight.
Bn Boonesboro	Severe: floods, depth to rock.	Severe: floods.	Severe: floods, depth to rock.	Severe: floods.	Severe: floods.	Moderate: floods.
CcC Culleoka	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope, depth to rock, small stones.
CcD, CfE Culleoka	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DoB Donerail	Severe: too clayey, wetness.	Moderate: wetness, low strength.	Severe: wetness, low strength.	Moderate: slope, wetness, low strength.	Severe: low strength.	Moderate: wetness.
Du Dunning	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
EdC Eden	Moderate: slope, too clayey, depth to rock.	Moderate: slope, low strength.	Moderate: slope, depth to rock, low strength.	Severe: slope.	Moderate: slope, low strength.	Moderate: too clayey.
EdD, EfE, EfF Eden	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ElB Elk	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength.	Slight.
ElC Elk	Moderate: slope, floods.	Severe: floods.	Severe: floods.	Severe: slope, floods.	Moderate: slope, floods, low strength.	Moderate: slope.
ElD Elk	Severe: slope.	Severe: slope, floods.	Severe: slope, floods.	Severe: slope, floods.	Severe: slope.	Severe: slope.
EvB Elk Variant	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.	Slight.
FaC Fairmount	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
FcE*, FcF* Fairmount Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
FdB Faywood	Severe: depth to rock, too clayey.	Moderate: depth to rock, low strength.	Severe: depth to rock.	Moderate: slope, depth to rock, low strength.	Moderate: depth to rock, low strength.	Moderate: depth to rock.
FdC Faywood	Severe: depth to rock, too clayey.	Moderate: slope, depth to rock, low strength.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, low strength.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FdE---------- Faywood	Severe: slope, depth to rock, too clayey.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Hu---------- Huntington	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods, frost action.	Moderate: floods.
Lc---------- Lawrence	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
Ld---------- Lindside	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Severe: floods.
LwB---------- Lowell	Moderate: too clayey, depth to rock.	Moderate: low strength.	Moderate: low strength, depth to rock.	Moderate: slope, low strength.	Moderate: low strength.	Slight.
LwC---------- Lowell	Moderate: slope, too clayey, depth to rock.	Moderate: slope, low strength.	Moderate: slope, low strength, depth to rock.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
MlA---------- Maury	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Slight.
MlB---------- Maury	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Slight.
MlC---------- Maury	Moderate: slope, too clayey.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
MnB---------- McAfee	Severe: depth to rock, too clayey.	Moderate: depth to rock, low strength.	Severe: depth to rock.	Moderate: slope, depth to rock, low strength.	Moderate: depth to rock, low strength.	Moderate: depth to rock.
MnC---------- McAfee	Severe: depth to rock, too clayey.	Moderate: slope, depth to rock, low strength.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, low strength.	Moderate: slope, depth to rock.
MnD---------- McAfee	Severe: depth to rock, slope, too clayey.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
MoC3---------- McAfee	Severe: depth to rock, too clayey.	Moderate: slope, depth to rock, low strength.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, low strength.	Severe: too clayey.
MrD*---------- McAfee Rock outcrop.	Severe: depth to rock, too clayey.	Moderate: slope, depth to rock, low strength.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, low strength.	Moderate: slope, depth to rock.
Mt---------- Melvin	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Ne---------- Newark	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Severe: floods.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 9.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AsA, AsB Ashton	Moderate: floods.	Severe: floods.	Moderate: floods.	Moderate: floods.	Good.
Bn Boonesboro	Severe: floods, depth to rock.	Severe: floods, depth to rock, seepage.	Severe: floods, depth to rock, seepage.	Severe: floods, seepage.	Fair: thin layer, small stones.
CcC Culleoka	Severe: depth to rock.	Severe: slope, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: slope, thin layer, large stones.
CcD Culleoka	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope.
CfE Culleoka	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: depth to rock, slope, seepage.	Severe: slope, seepage.	Poor: slope.
DoB Donerail	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Moderate: wetness.	Poor: too clayey.
Du Dunning	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: wetness, thin layer.
EdC Eden	Severe: percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.
EdD Eden	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, too clayey.
EfE, EfF Eden	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, too clayey.
ElB Elk	Moderate: floods.	Severe: floods.	Moderate: floods.	Moderate: floods.	Good.
ElC Elk	Moderate: slope, floods.	Severe: slope, floods.	Moderate: floods.	Moderate: slope, floods.	Fair: slope.
ElD Elk	Severe: slope.	Severe: slope, floods.	Moderate: slope, floods.	Severe: slope.	Poor: slope.
EvB Elk Variant	Slight	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
FaC Fairmount	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FcE*---------- Fairmount	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, too clayey.
Rock outcrop.					
FcF*---------- Fairmount	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, too clayey.
Rock outcrop.					
FdB---------- Faywood	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Slight----------	Poor: thin layer.
FdC---------- Faywood	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: thin layer.
FdE---------- Faywood	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: slope, thin layer.
Hu---------- Huntington	Severe: floods.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Good.
Lc---------- Lawrence	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Good.
Ld---------- Lindside	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
LwB---------- Lowell	Severe: percs slowly.	Moderate: depth to rock.	Severe: depth to rock.	Slight----------	Poor: too clayey.
LwC---------- Lowell	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.
MlA---------- Maury	Slight----------	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
MlB---------- Maury	Slight----------	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
MlC---------- Maury	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope, too clayey.
MnB---------- McAfee	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Slight----------	Poor: too clayey, depth to rock.
MnC---------- McAfee	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, depth to rock.
MnD---------- McAfee	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: slope, too clayey, depth to rock.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MoC3---------- McAfee	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, depth to rock.
MrD*---------- McAfee	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, depth to rock.
Rock outcrop.					
Mt---------- Melvin	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Ne---------- Newark	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 10.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. Absence of an entry means soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
AsA, AsB---------- Ashton	Seepage----------	Piping----------	Not needed-------	Erodes easily, slope.	Erodes easily, slope.
Bn---------- Boonesboro	Seepage, depth to rock.	Seepage, thin layer, piping.	Not needed-------	Not needed-------	Erodes easily, depth to rock.
CcC, CcD, CfE----- Culleoka	Depth to rock, seepage.	Thin layer--------	Not needed-------	Large stones, small stones, slope.	Large stones, slope.
DoB---------- Donerail	Favorable---------	Hard to pack, wetness.	Percs slowly-----	Wetness----------	Erodes easily.
Du---------- Dunning	Favorable---------	Hard to pack, wetness.	Floods, percs slowly.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.
EdC, EdD, EfE, EfF---------- Eden	Depth to rock-----	Hard to pack, thin layer.	Not needed-------	Erodes easily, percs slowly, slope.	Erodes easily, percs slowly, slope.
ElB, ElC, ElD----- Elk	Seepage----------	Low strength, piping.	Not needed-------	Slope----------	Slope.
EvB---------- Elk Variant	Seepage----------	Piping----------	Not needed-------	Slope----------	Slope.
FaC---------- Fairmount	Depth to rock-----	Thin layer, hard to pack.	Not needed-------	Depth to rock, slope.	Slope, erodes easily, rooting depth.
FcE*, FcF*-------- Fairmount	Depth to rock-----	Thin layer, hard to pack.	Not needed-------	Depth to rock, slope.	Slope, rooting depth, erodes easily.
Rock outcrop.					
FdB, FdC, FdE----- Faywood	Depth to rock, slope.	Low strength, hard to pack.	Not needed-------	Depth to rock, slope.	Slope, erodes easily, rooting depth.
Hu---------- Huntington	Slope, seepage.	Low strength, piping.	Not needed-------	Not needed-------	Not needed.
Lc---------- Lawrence	Favorable---------	Piping, wetness.	Percs slowly, wetness.	Not needed-------	Percs slowly, wetness, rooting depth.
Ld---------- Lindside	Seepage----------	Low strength, erodes easily, piping.	Floods----------	Not needed-------	Wetness.
LwB, LwC---------- Lowell	Slope----------	Low strength------	Not needed-------	Slope----------	Erodes easily, slope.
MlA, MlB, MlC----- Maury	Seepage----------	Low strength, hard to pack.	Not needed-------	Slope----------	Slope.
MnB, MnC, MnD, MoC3---------- McAfee	Depth to rock-----	Low strength, thin layer, hard to pack.	Not needed-------	Depth to rock, slope.	Slope, erodes easily, rooting depth.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
MrD*---------- McAfee Rock outcrop.	Depth to rock-----	Low strength, thin layer, hard to pack.	Not needed-------	Depth to rock, slope.	Slope, erodes easily, rooting depth.
Mt---------- Melvin	Seepage----------	Wetness----------	Wetness, floods.	Not needed-------	Wetness, erodes easily.
Ne---------- Newark	Seepage----------	Low strength, piping.	Wetness, floods, poor outlets.	Not needed-------	Wetness, erodes easily.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AsA, AsB---------- Ashton	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Bn---------- Boonesboro	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Good.
CcC---------- Culleoka	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
CcD---------- Culleoka	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
CfE---------- Culleoka	Poor: slope, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, small stones.
DoB---------- Donerail	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Du---------- Dunning	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
EdC---------- Eden	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones, too clayey.
EdD---------- Eden	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey, large stones.
EfE, EfF---------- Eden	Poor: slope, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey, large stones.
ElB---------- Elk	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
ElC---------- Elk	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
ElD---------- Elk	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
EvB---------- Elk Variant	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
FaC---------- Fairmount	Poor: low strength, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
FcE*---------- Fairmount	Poor: low strength, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Rock outcrop.				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
FcF*---------- Fairmount	Poor: slope, low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Rock outcrop.				
FdB, FdC---------- Faywood	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
FdE---------- Faywood	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer.
Hu---------- Huntington	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Lc---------- Lawrence	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Ld---------- Lindside	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
LwB, LwC---------- Lowell	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
MlA, MlB---------- Maury	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
MlC---------- Maury	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
MnB, MnC---------- McAfee	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
MnD---------- McAfee	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer.
MoC3---------- McAfee	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
MrD*---------- McAfee	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Rock outcrop.				
Mt---------- Melvin	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Ne---------- Newark	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AsA, AsB---------- Ashton	0-22	Silt loam-------	ML, CL	A-4	0	95-100	90-100	75-100	60-95	<35	NP-10
	22-61	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-42	5-20
Bn---------- Boonesboro	0-21	Silt loam-------	ML, CL, CL-ML	A-4, A-6	0-5	90-100	85-100	80-100	70-95	25-35	4-11
	21-28	Gravelly silt loam, flaggy loam, very gravelly silty clay loam.	GM, GC, CL, CL-ML	A-2, A-4, A-6	0-20	50-75	40-70	35-65	25-60	25-42	5-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CcC, CcD---------- Culleoka	0-5	Silt loam-------	ML, CL, CL-ML	A-4	0-10	90-100	85-100	70-100	55-95	<35	NP-10
	5-24	Channery silt loam, flaggy loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4	5-25	80-95	75-95	65-95	55-90	20-40	2-20
	24-38	Very flaggy silty clay loam, flaggy loam.	ML, CL, GC, SM	A-6, A-4, A-2	10-30	60-95	50-90	40-90	30-85	20-40	2-20
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CfE---------- Culleoka	0-5	Flaggy silt loam	ML, CL, SM, CL-ML	A-4	5-25	80-95	75-90	60-90	45-85	<35	NP-10
	5-24	Channery silt loam, flaggy loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4	5-25	80-95	75-95	65-95	55-90	20-40	2-20
	24-38	Very flaggy silty clay loam, flaggy loam.	ML, CL, GC, SM	A-6, A-4, A-2	10-30	60-95	50-90	40-90	30-85	20-40	2-20
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DoB---------- Donerail	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-95	25-35	5-12
	11-17	Silt loam, silty clay loam.	CL	A-4, A-6	0	95-100	95-100	85-100	80-95	25-40	8-20
	17-35	Silty clay, clay.	CL, CH	A-7, A-6	0	95-100	95-100	90-100	85-95	35-55	12-30
	35-60	Clay, silty clay	CH, CL	A-7	0	95-100	95-100	85-100	85-95	45-70	20-40
Du---------- Dunning	0-16	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-95	34-42	15-22
	16-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	95-100	95-100	90-100	85-100	45-70	20-40
EdC, EdD---------- Eden	0-5	Silty clay loam	ML, CL, MH, CH	A-7, A-6	0-20	85-100	80-100	75-100	70-100	35-65	12-35
	5-30	Flaggy silty clay, flaggy clay, silty clay.	MH, CH, CL	A-7	10-30	75-100	70-100	65-100	60-100	45-75	20-45
	30	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
EfE, EfF---------- Eden	0-5	Flaggy silty clay.	ML, CL, MH, CH	A-7, A-6	10-30	65-75	60-70	60-70	55-65	35-65	12-35
	5-30	Flaggy silty clay, flaggy clay, silty clay.	MH, CH, CL	A-7	10-30	75-100	70-100	65-100	60-100	45-75	20-45
	30	Weathered bedrock.	---	---	---	---	---	---	---	---	---
ElB, ElC, ElD------ Elk	0-8	Silt loam-------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	8-48	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	48-64	Silty clay loam, silt loam.	ML, CL, CL-ML, SM-SC	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
EvB---------- Elk Variant	0-8	Silt loam-------	ML, CL-ML	A-4	0	90-100	90-100	85-100	70-95	25-35	3-10
	8-48	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	90-100	90-100	85-100	70-100	30-40	5-20
	48-65	Silty clay loam, silty clay.	CL, CH	A-6, A-7	0	90-100	90-100	85-100	80-100	35-60	15-35
FaC---------- Fairmount	0-11	Flaggy silty clay.	CH, CL	A-7	8-50	80-100	70-100	65-100	60-100	45-70	20-40
	11-17	Flaggy silty clay loam, flaggy clay, flaggy silty clay.	CH, CL	A-7, A-6	8-50	80-100	70-100	65-100	60-100	40-70	20-40
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
FcE*, FcF*--------- Fairmount	0-11	Flaggy silty clay.	CH, CL	A-7	8-50	80-100	70-100	65-100	60-100	45-70	20-40
	11-17	Flaggy silty clay loam, flaggy clay, flaggy silty clay.	CH, CL	A-7, A-6	8-50	80-100	70-100	65-100	60-100	40-70	20-40
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
FdB, FdC, FdE------ Faywood	0-6	Silt loam-------	ML, CL, CL-ML	A-4	0-15	100	95-100	90-100	85-100	25-35	4-10
	6-30	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-15	90-100	90-100	85-100	75-100	42-70	20-45
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hu---------- Huntington	0-12	Silt loam-------	ML, CL	A-4, A-6	0	95-100	95-100	85-100	60-95	25-35	4-15
	12-66	Silt loam, loam, silty clay loam.	ML, CL	A-4, A-6	0	95-100	95-100	85-100	60-95	25-35	4-15
	66-74	Stratified sandy loam, loam, silt loam.	SM, SC, ML, CL	A-2, A-4	0	95-100	60-100	50-90	30-75	<30	NP-10

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Lc---------- Lawrence	0-8	Silt loam-------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	80-100	25-35	2-10
	8-18	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	18-43	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	43-75	Silty clay, silty clay loam, silt loam.	ML, CL, MH, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	75-100	25-60	5-25
Ld---------- Lindside	0-43	Silt loam-------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	95-100	55-90	25-40	2-15
	43-62	Silt loam, silty clay loam, loam.	CL, ML, CL-ML	A-4, A-6, A-7,	0	100	95-100	90-100	55-95	20-45	1-25
LwB, LwC---------- Lowell	0-11	Silt loam-------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	11-23	Silty clay, clay, silty clay loam.	CL, CH, MH	A-7, A-6	0	100	95-100	90-100	85-100	35-65	15-35
	23-53	Clay, silty clay	CH, MH, CL	A-7	0-10	95-100	90-100	85-100	75-100	45-75	20-45
	53	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MlA, MlB, MlC------ Maury	0-16	Silt loam-------	CL, CL-ML, ML	A-4	0	100	95-100	90-100	80-100	25-35	4-10
	16-54	Silty clay loam, silty clay, clay.	CL, MH, CH	A-7, A-6	0	95-100	90-100	85-100	80-100	35-60	15-35
	54-96	Silty clay, clay, silty clay loam.	MH, CH, CL	A-7, A-6	0	95-100	90-100	85-100	75-100	35-70	20-40
MnB, MnC, MnD------ McAfee	0-7	Silt loam-------	ML, CL-ML	A-4	0-10	90-100	85-100	75-100	70-100	25-35	4-10
	7-25	Silty clay, silty clay loam, clay.	CL, CH, MH	A-7, A-6	0-10	90-100	85-100	80-100	75-100	35-65	15-35
	25-30	Clay, silty clay	CH, MH, CL	A-7	0-15	80-100	75-100	70-100	65-95	45-75	20-45
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MoC3---------- McAfee	0-6	Silty clay------	CH, CL	A-7	0-10	90-100	85-100	85-100	80-95	45-55	20-27
	6-24	Silty clay, silty clay loam, clay.	CL, CH, MH	A-7, A-6	0-10	90-100	85-100	80-100	75-100	35-65	15-35
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MrD*---------- McAfee	0-7	Silt loam-------	ML, CL-ML	A-4	0-10	90-100	85-100	75-100	70-100	25-35	4-10
	7-25	Silty clay, silty clay loam, clay.	CL, CH, MH	A-7, A-6	0-10	90-100	85-100	80-100	75-100	35-65	15-35
	25-30	Clay, silty clay	CH, MH, CL	A-7	0-15	80-100	75-100	70-100	65-95	45-75	20-45
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Mt---------- Melvin	0-8	Silt loam-------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	65-95	25-35	4-10
	8-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	70-100	60-95	25-40	5-20
Ne---------- Newark	0-10	Silt loam-------	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<35	NP-10
	10-60	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-95	25-42	5-20

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 13.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AsA Ashton	Moderate: floods.	Slight	Slight	Slight.
AsB Ashton	Moderate: floods.	Slight	Moderate: slope.	Slight.
Bn Boonesboro	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight.
CcC Culleoka	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CcD Culleoka	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
CfE Culleoka	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.
DoB Donerail	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: slope, wetness, percs slowly.	Slight.
Du Dunning	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.
EdC Eden	Moderate: slope, percs slowly.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
EdD Eden	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.
EfE, EfF Eden	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.
ElB Elk	Severe: floods.	Slight	Moderate: slope.	Slight.
ElC Elk	Severe: floods.	Moderate: slope.	Severe: slope.	Slight.
ElD Elk	Severe: slope, floods.	Severe: slope.	Severe: slope.	Moderate: slope.
EvB Elk Variant	Slight	Slight	Moderate: slope.	Slight.
FaC Fairmount	Severe: too clayey.	Severe: too clayey.	Severe: slope, depth to rock, too clayey.	Severe: too clayey.
FcE*, FcF* Fairmount	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
FdB Faywood	Moderate: percs slowly.	Slight	Moderate: depth to rock, slope.	Slight.
FdC Faywood	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
FdE Faywood	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Hu Huntington	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight.
Lc Lawrence	Severe: wetness.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
Ld Lindside	Severe: floods.	Moderate: floods, wetness.	Moderate: floods, wetness.	Slight.
LwB Lowell	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
LwC Lowell	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
MlA Maury	Slight	Slight	Slight	Slight.
MlB Maury	Slight	Slight	Moderate: slope.	Slight.
MlC Maury	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
MnB McAfee	Moderate: percs slowly.	Slight	Moderate: depth to rock, slope, percs slowly.	Slight.
MnC McAfee	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
MnD McAfee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
MoC3 McAfee	Severe: too clayey.	Severe: too clayey.	Severe: slope.	Severe: too clayey.
MrD* McAfee Rock outcrop.	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
Mt Melvin	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.
Ne Newark	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods, wetness.	Moderate: wetness.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 14.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AsA, AsB---- Ashton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Bn---- Boonesboro	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CcC---- Culleoka	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CcD---- Culleoka	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CfE---- Culleoka	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DoB---- Donerail	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Du---- Dunning	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
EdC---- Eden	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EdD---- Eden	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EfE---- Eden	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
EfF---- Eden	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ElB---- Elk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ElC, ElD---- Elk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EvB---- Elk Variant	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FaC---- Fairmount	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
FcE*---- Fairmount Rock outcrop.	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
FcF*---- Fairmount Rock outcrop.	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
FdB---- Faywood	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FdC---- Faywood	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FdE---- Faywood	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hu---- Huntington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 14.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Lc---- Lawrence	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ld---- Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LwB---- Lowell	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LwC---- Lowell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MlA, MlB---- Maury	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MlC---- Maury	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MnB---- McAfee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MnC---- McAfee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MnD---- McAfee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MoC3---- McAfee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MrD*---- McAfee Rock outcrop.	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Mt---- Melvin	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ne---- Newark	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 15.--ENGINEERING TEST DATA

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution										Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve							Percentage smaller than--					Max. dry density	Optimum moisture
	AASHTO	Unified	1.5 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
													Pct		Lb/ ft3	Pct
Elk silt loam: (73KY-57-2)																
B1t----------5-20	A-4(9)	CL	100	100	100	100	100	96	92	72	39	29	32	10	105	19
B21t---------20-37	A-6(11)	CL	100	100	100	100	100	96	93	76	41	33	34	11	105	20
C----------52-64	A-4(8)	ML, CL	100	100	100	100	100	94	90	73	46	36	32	9	104	20
Fairmount silty clay: (KY73-57-4)																
B----------8-17	A-7-5(29)	CH	100	100	100	100	100	98	92	76	59	52	55	28	93	26
Faywood silty clay loam: (73KY-57-3)																
Ap----------0-5	A-6(16)	CL	100	100	100	100	100	96	92	71	40	29	37	17	101	22
B2t----------5-26	A-7-6(44)	CH	100	100	100	100	100	98	93	74	60	52	66	41	94	23
Huntington silt loam: (73KY-57-5)																
B2----------19-56	A-4(2)	ML	100	100	100	100	100	100	74	58	30	20	28	4	108	19
Maury silt loam: (72KY-120-1)																
Ap----------0-8	A-4(8)	ML	100	100	100	100	100	96	93	79	36	22	33	9	102	22
B22t---------24-32	A-7-6(17)	CL	100	100	100	100	100	94	91	70	51	40	41	16	101	20
B26t---------54-64	A-7-5(15)	MH	100	100	100	100	100	93	81	71	54	48	52	15	95	28
B3t---------91-102	A-7-5(18)	MH	100	100	100	99	99	97	82	73	57	48	53	19	98	26
McAfee silt loam: (73KY-120-4)																
B22t---------14-26	A-6(18)	CL	100	100	100	100	100	93	89	76	51	41	38	21	103	21
Lowell silt loam: (S72KY-57-1)																
B21t---------16-23	A-7-5(29)	MH	100	96	92	85	85	82	76	66	49	41	69	34	90	21
B3t----------32-41	A-7-5(14)	MH	100	100	99	95	95	89	76	67	56	50	56	15	90	30
Lowell silt loam: (S72KY-120-3)																
B21t---------14-24	A-7-5(18)	ML	100	100	100	100	100	95	91	79	53	43	48	15	100	23
B3t----------32-39	A-7-5(24)	MH	100	100	100	100	100	97	85	73	59	47	63	22	94	26

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
AsA, AsB	0-22	0.6-2.0	0.16-0.23	5.6-7.3	Low	Low	Low	0.43	4
Ashton	22-61	0.6-2.0	0.18-0.23	5.6-7.3	Low	Low	Low	0.43	
Bn	0-21	0.6-2.0	0.18-0.23	6.1-7.8	Low	Low	Low	0.37	3
Boonesboro	21-28	6.0-20	0.06-0.12	6.1-7.8	Low	Low	Low	0.17	
	28	---	---	---	---	---	---	---	
CcC, CcD	0-5	2.0-6.0	0.14-0.20	5.1-6.0	Low	Low	Moderate	0.32	3
Culleoka	5-24	2.0-6.0	0.12-0.20	5.1-6.0	Low	Low	Moderate	0.28	
	24-38	2.0-6.0	0.05-0.14	5.1-6.5	Low	Low	Moderate	0.17	
	38	---	---	---	---	---	---	---	
CfE	0-5	2.0-6.0	0.10-0.18	5.1-6.0	Low	Low	Moderate	0.28	3
Culleoka	5-24	2.0-6.0	0.12-0.20	5.1-6.0	Low	Low	Moderate	0.28	
	24-38	2.0-6.0	0.05-0.14	5.1-6.5	Low	Low	Moderate	0.17	
	38	---	---	---	---	---	---	---	
DoB	0-11	0.6-2.0	0.19-0.23	6.1-7.3	Low	Moderate	Moderate	0.37	3
Donerail	11-17	0.6-2.0	0.18-0.23	5.1-6.5	Low	Moderate	Moderate	0.28	
	17-35	0.6-2.0	0.15-0.20	4.5-6.0	Moderate	Moderate	Moderate	0.28	
	35-60	0.06-0.2	0.12-0.16	5.6-7.8	Moderate	Moderate	Moderate	0.28	
Du	0-16	0.6-2.0	0.19-0.23	5.6-7.8	Moderate	High	Moderate	0.28	4
Dunning	16-60	0.06-0.2	0.14-0.18	5.6-7.8	Moderate	High	Moderate	0.28	
EdC, EdD	0-5	0.06-0.6	0.12-0.18	5.1-8.4	Moderate	Moderate	Low	0.43	3
Eden	5-30	0.06-0.2	0.10-0.15	5.1-8.4	Moderate	Moderate	Low	0.28	
	30	---	---	---	---	---	---	0.17	
EfE, EfF	0-5	0.06-0.6	0.12-0.18	5.1-8.4	Moderate	Moderate	Low	0.43	3
Eden	5-30	0.06-0.2	0.10-0.15	5.1-8.4	Moderate	Moderate	Low	0.28	
	30	---	---	---	---	---	---	0.17	
ElB, ElC, ElD	0-8	0.6-2.0	0.19-0.23	4.5-6.0	Low	Moderate	Moderate	0.32	4
Elk	8-48	0.6-2.0	0.18-0.22	4.5-6.0	Low	Moderate	Moderate	0.28	
	48-64	0.6-2.0	0.14-0.20	5.1-6.5	Low	Moderate	Moderate	0.28	
EvB	0-8	0.6-2.0	0.19-0.23	5.1-7.3	Low	Moderate	Moderate	0.32	4
Elk Variant	8-48	0.6-2.0	0.18-0.22	5.1-6.0	Low	Moderate	Moderate	0.28	
	48-65	0.6-2.0	0.15-0.20	5.1-6.0	Low	Moderate	Moderate	0.28	
FaC	0-11	0.6-0.6	0.10-0.18	6.6-8.4	Moderate	Moderate	Low	0.37	2
Fairmount	11-17	0.6-0.6	0.10-0.18	6.6-8.4	Moderate	Moderate	Low	0.37	
	17	---	---	---	---	---	---	---	
FcE*, FcF*	0-11	0.06-0.6	0.10-0.18	6.6-8.4	Moderate	Moderate	Low	0.37	2
Fairmount	11-17	0.06-0.6	0.10-0.18	6.6-8.4	Moderate	Moderate	Low	0.37	
	17	---	---	---	---	---	---	---	
Rock outcrop.									
FdB, FdC, FdE	0-6	0.6-2.0	0.18-0.22	5.1-7.3	Low	High	Moderate	0.37	3
Faywood	6-30	0.06-0.6	0.12-0.17	5.1-7.3	Moderate	High	Moderate	0.28	
	30	---	---	---	---	---	---	---	
	17	---	---	---	---	---	---	---	
Hu	0-12	0.6-2.0	0.18-0.24	5.6-7.8	Low	Low	Moderate	0.43	4
Huntington	12-66	0.6-2.0	0.10-0.16	5.6-7.8	Low	Low	Moderate	0.43	
	66-74	0.6-2.0	0.10-0.16	5.6-7.8	Low	Low	Moderate	0.43	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
Lc	0-8	0.6-2.0	0.19-0.23	4.5-5.5	Low	High	High	0.43	3
Lawrence	8-18	0.6-2.0	0.18-0.22	4.5-5.5	Low	High	High	0.37	
	18-43	0.06-0.2	0.08-0.12	4.5-5.5	Low	High	High	0.43	
	43-75	0.06-0.6	0.08-0.12	4.5-7.3	Low	High	High	0.37	
Ld	0-43	0.6-2.0	0.20-0.26	5.1-7.8	Low	Moderate	Low	0.43	4
Lindside	43-62	0.2-2.0	0.12-0.18	5.6-7.8	Low	Moderate	Low	0.43	
LwB, LwC	0-11	0.6-2.0	0.18-0.23	4.5-6.5	Low	High	Moderate	0.37	3
Lowell	11-23	0.2-2.0	0.13-0.19	4.5-6.5	Moderate	High	Moderate	0.28	
	23-53	0.2-0.6	0.12-0.17	5.1-7.8	Moderate	High	Moderate	0.28	
	53	---	---	---	---	---	---	---	
MlA, MlB, MlC	0-16	2.0-6.0	0.18-0.23	5.1-7.3	Low	Low	Low	0.32	4
Maury	16-54	0.6-6.0	0.15-0.20	5.1-6.5	Low	Moderate	Moderate	0.28	
	54-96	0.6-2.0	0.13-0.18	4.5-6.0	Low	Moderate	Moderate	0.28	
MnB, MnC, MnD	0-7	0.6-2.0	0.18-0.23	5.6-7.3	Low	High	Moderate	0.37	3
McAfee	7-25	0.2-0.6	0.13-0.18	5.6-7.3	Moderate	High	Moderate	0.28	
	25-30	0.2-0.6	0.10-0.16	6.1-7.8	Moderate	High	Low	0.28	
	30	---	---	---	---	---	---	---	
MoC3	0-6	0.2-0.6	0.18-0.22	5.6-7.3	Moderate	High	Moderate	0.28	2
McAfee	6-24	0.2-0.6	0.13-0.18	5.6-7.3	Moderate	High	Moderate	0.28	
	24	---	---	---	---	---	---	---	
MrD*	0-7	0.6-2.0	0.18-0.23	5.6-7.3	Low	High	Moderate	0.37	3
McAfee	7-25	0.2-0.6	0.13-0.18	5.6-7.3	Moderate	High	Moderate	0.28	
	25-30	0.2-0.6	0.10-0.16	6.1-7.8	Moderate	High	Low	0.28	
	30	---	---	---	---	---	---	---	
Rock outcrop.									
Mt	0-8	0.6-2.0	0.18-0.23	6.1-7.8	Low	High	Low	0.43	4
Melvin	8-60	0.6-2.0	0.18-0.23	6.1-7.8	Low	High	Low	0.43	
Ne	0-10	0.6-2.0	0.15-0.23	5.6-7.8	Low	High	Low	0.43	4
Newark	10-60	0.6-2.0	0.18-0.23	5.6-7.8	Low	High	Low	0.43	

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 17.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
AsA, AsB---------- Ashton	B	Rare--------	Very brief	Jan-May	>6.0	---	---	>60	---
Bn---------- Boonesboro	B	Common------	Brief-----	Dec-May	>6.0	---	---	20-40	Hard
CcC, CcD, CfE----- Culleoka	B	None--------	---	---	>6.0	---	---	20-40	Rippable
DoB---------- Donerail	C	None--------	---	---	1.5-3.0	Perched	Jan-Apr	>60	---
Du---------- Dunning	D	Common------	Brief-----	Dec-May	0-0.5	Apparent	Jan-Apr	>60	---
EdC, EdD, EfE, EfF---------- Eden	C	None--------	---	---	>6.0	---	---	20-40	Rippable
ElB, ElC, ElD----- Elk	B	Rare--------	Brief-----	Jan-May	>6.0	---	---	>60	---
EvB---------- Elk Variant	B	None--------	---	---	>6.0	---	---	>60	---
FaC---------- Fairmount	D	None--------	---	---	>6.0	---	---	10-20	Hard
FcE*, FcF*-------- Fairmount Rock outcrop.	D	None--------	---	---	>6.0	---	---	10-20	Hard
FdB, FdC, FdE----- Faywood	C	None--------	---	---	>6.0	---	---	20-40	Hard
Hu---------- Huntington	B	Common------	Brief-----	Dec-May	3.0-6.0	Apparent	Dec-Apr	>60	---
Lc---------- Lawrence	C	None--------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---
Ld---------- Lindside	C	Common------	Very brief	Dec-May	1.5-3.0	Apparent	Dec-Apr	>60	---
LwB, LwC---------- Lowell	C	None--------	---	---	>6.0	---	---	>40	Hard
MlA, MlB, MlC----- Maury	B	None--------	---	---	>6.0	---	---	>60	---
MnB, MnC, MnD, MoC3---------- McAfee	C	None--------	---	---	>6.0	---	---	20-40	Hard
MrD*---------- McAfee Rock outcrop.	C	None--------	---	---	>6.0	---	---	20-40	Hard

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
Mt---------- Melvin	D	Common------	Brief-----	Dec-May	0.0-1.0	Apparent	Dec-May	>60	---
Ne---------- Newark	C	Common------	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---

* See mapping unit description for the composition and behavior of the mapping unit.

TABLE 18.--PHYSICAL ANALYSIS OF SELECTED SOILS

Soil name, report number, horizon, and depth in inches	Size class and particle diameter (mm)											Coarse fragments		
	Total			Sand					Sand coarser than very fine (2-0.1)	Very fine sand plus silt (0.1-0.002)	Textural class	>2 mm	2-19 mm	19-76 mm
	Sand (2-0.05)	Silt (0.05-0.002)	Int IV Clay (<0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)						
	Pct <2 mm											Pct	Pct	Pct
*Fairmount flaggy silty clay: (76KY-239-1)														
A1-------0-11	9.78	38.37	51.85	0.79	1.40	1.80	3.44	2.33	7.43	40.70	Clay---	---	---	---
B-------11-17	6.92	39.39	53.71	0.63	0.82	1.24	2.36	1.78	5.05	41.15	Clay, silty clay.	---	---	---
R---------17+														
Donerail silt loam: (76KY-113-2)														
Ap-------0-13	9.22	61.99	28.79	1.55	2.70	1.97	1.78	1.15	8.00	63.14	Silty clay loam, silt loam.	---	---	---
B21t----13-29	9.34	36.59	54.07	1.81	1.99	1.51	2.32	1.67	7.63	38.26	Clay---	---	---	---
B22t----29-48	10.98	39.58	49.48	1.81	1.99	1.84	3.13	2.14	8.77	41.32	Clay, silty clay.	---	---	---
C-------48-65	14.39	35.83	49.78	3.91	2.68	2.07	3.13	2.53	11.79	38.36	Clay---	---	---	---
Lowell silt loam: (72KY-57-1)														
Ap-------0-11	6.35	64.53	29.12	0.29	1.56	1.58	1.59	1.33	5.02	65.86	Silty clay loam.	---	---	---
B1t&A---11-16	5.30	56.76	37.94	0.26	1.23	1.20	1.40	1.21	4.09	57.97	Silty clay loam.	1.83	1.83	---
B21t----16-23	5.66	36.14	58.20	0.46	1.29	1.07	1.51	1.33	4.33	37.47	Clay---	2.45	2.45	---
B22t----23-32	11.48	27.89	60.63	0.71	2.22	2.33	3.40	2.82	8.66	30.71	Clay---	6.51	6.51	---
B3t-----32-41	15.67	21.37	62.96	0.52	1.90	2.80	5.50	4.95	10.72	26.32	Clay---	10.72	10.72	---
C-------41-53	9.72	24.21	66.07	0.05	0.33	1.00	2.94	5.40	4.32	29.61	Clay---	5.09	5.09	---
R---------53+														
Lowell silt loam: (72KY-120-3)														
Ap--------0-8	4.93	69.71	25.36	0.21	1.10	1.31	1.31	1.00	3.93	70.71	Silt loam.	----	---	---
B1t------8-14	3.91	60.88	35.21	0.08	0.78	1.06	1.12	0.87	3.04	61.75	Silty clay loam.	---	---	---
B21t----14-24	6.76	48.31	44.93	0.19	1.41	1.58	1.94	1.64	5.12	49.95	Silty clay.	---	---	---
B22t----14-32	7.77	31.78	60.45	0.09	1.10	1.56	2.65	2.37	5.40	34.15	Clay---	---	---	---
B3t-----32-39	8.66	28.88	62.46	0.06	0.72	1.27	3.22	3.39	5.27	32.27	Clay---	---	---	---
C1------39-45	6.72	34.89	58.39	0.15	0.29	0.55	2.35	3.38	3.34	38.27	Clay---	---	---	---
C2------45-50	2.32	51.60	46.08	0.08	0.31	0.27	0.59	1.07	1.25	52.67	Silty clay.	---	---	---
R---------50+														

See footnote at end of table.

TABLE 18.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name, report number, horizon, and depth in inches	Size class and particle diameter (mm)													
	Total			Sand					Sand coarser than very fine (2-0.1)	Very fine sand plus silt (0.1-0.002)	Textural class	Coarse fragments		
	Sand (2-0.05)	Silt (0.05-0.002)	Int. IV Clay (<0.002)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)				>2 mm	2-19 mm	19-76 mm
	Pct <2 mm											Pct	Pct	Pct
Maury silt loam: (72KY-120-1)														
Ap--------0-8	4.6	73.1	22.3	0.4	1.9	1.1	0.8	0.4	4.2	73.5	Silt loam.	---	---	---
B1t------8-13	5.0	65.4	29.6	0.8	1.9	0.9	0.8	0.6	4.4	66.0	Silty clay loam.	---	---	---
B21t----13-23	5.2	61.6	33.2	0.9	1.9	1.2	0.9	0.3	4.9	61.9	Silty clay loam.	---	---	---
B22t----23-32	7.4	55.0	37.6	1.4	3.0	1.4	1.2	0.4	7.0	55.4	Silty clay loam.	---	---	---
B23t----32-40	7.7	52.0	40.3	1.6	3.2	1.4	1.3	0.2	7.5	52.2	Silty clay, silty clay loam.	---	---	---
B24t----40-47	9.0	48.1	42.9	1.7	3.5	1.6	1.9	0.3	8.7	48.4	Silty clay.	---	---	---
B25t----47-54	13.5	40.6	45.9	2.0	3.4	2.2	3.9	2.0	11.5	42.6	Silty clay, clay.	---	---	---
B26t----54-64	15.6	36.7	47.7	0.8	2.6	2.6	6.5	3.1	12.5	39.8	Clay---	---	---	---
B27t----64-75	14.2	39.9	45.9	0.4	1.9	3.5	8.2	0.2	14.0	40.1	Clay, silty clay.	---	---	---
B28t----75-91	22.9	22.5	54.6	0.3	2.9	5.3	9.0	5.4	17.5	27.9	Clay---	---	---	---
B3t----91-102	15.7	38.2	46.1	0.6	1.5	2.0	5.9	5.7	10.0	43.9	Clay---	---	---	---

*Fairmount sample has slightly less silt than required for silty clay textural class. This is considered to be within the normal error in sampling and analyzing.

TABLE 19.--CHEMICAL ANALYSIS OF SELECTED SOILS

Soil name report number horizon, and depth in inches	pH (1:1) H_2O	pH (1:1) KCL	Extractable bases: Ca	Mg	K	Na	TEB	CEC	Exc. acidity	Sum cations	Al	H+Al	Base saturation: TEB/CEC	TEB/SC	P	$CaCO_3$ EQ	Organic matter
			Milliequivalents per 100 grams of soil										Pct	Pct	P/m	Pct	Pct
Fairmount flaggy silty clay: (76KY-230-1)																	
A1----------0-11	7.00	6.00	38.65	1.34	0.64	---	40.63	33.06	11.4	51.77		0.03	122.90	78.48	152	0.59	7.15
B----------11-17	7.25	6.25	43.65	0.76	0.36	---	44.77	27.42	9.14	53.91		0.55	163.27	83.04	170	1.26	3.40
Donerail silt loam: (76KY-113-2)																	
Ap----------0-13	4.45	3.75	9.50	1.14	0.36	---	11.0	17.92	26.70	37.70		0.28	61.38	29.17	40.8	0.16	3.28
B21t----------13-29	4.60	3.65	19.50	1.18	0.26	---	20.94	27.45	29.27	50.21		0.74	76.28	41.70	43.5	0.15	0.81
B22t----------29-48	4.50	3.55	16.75	1.06	0.23	---	18.04	26.92	30.42	48.46		0.83	67.01	37.23	123.3	0.23	0.59
C----------48-65	4.55	3.70	23.25	1.29	0.28	---	24.82	28.38	27.27	52.09		0.38	87.45	47.65	12.3	0.16	0.49
Lowell silt loam: (72KY-57-1)																	
Ap----------0-11	6.13	5.64	10.33	1.33	0.25	0.02	11.93	17.35	18.24	30.17			68.76	39.54	94.5	0.18	3.66
B1t&A----------11-16	5.63	4.90	10.40	0.83	0.18	0.03	11.44	18.89	20.24	31.68	0.23		60.56	36.11	162.5	0.21	1.25
B21t----------16-23	5.18	4.14	14.00	1.08	0.29	0.06	15.43	31.13	28.80	44.23	2.34		49.57	34.89	202.5	0.12	0.70
B22t----------23-32	4.83	3.93	12.08	0.85	0.27	0.05	13.25	34.38	37.64	50.89	2.57		38.54	26.04	215.0	0.20	0.53
B3t----------32-41	4.83	3.90	12.50	0.55	0.26	0.06	13.37	32.49	35.08	48.45	3.36		41.15	27.60	162.5	0.34	0.43
C----------41-53	5.58	4.80	27.15	0.50	0.26	0.08	27.99	34.63	22.52	50.51			80.83	55.41	75.0	0.27	0.41
R----------53+																	
Lowell silt loam: (72KY-120-3)																	
Ap----------0-8	5.90	4.90	8.25	0.72	0.12	0.03	9.12	13.60	4.80	13.92			67.06	65.52	58.5	0.15	2.14
B1t----------8-14	5.68	4.70	9.10	0.78	0.16	0.04	10.08	16.17	5.96	16.04			62.34	62.84	8.8	0.12	0.99
B21t----------14-24	5.05	3.73	9.45	0.85	0.21	0.04	10.55	24.63	15.08	25.63	4.28		42.83	41.16	88.0	0.11	0.48
B22t----------24-32	4.65	3.35	11.35	0.93	0.27	0.05	12.60	38.88	28.64	42.24	3.30		32.41	29.83	159.5	0.12	0.38
B3t----------32-39	4.90	3.50	14.03	0.90	0.28	0.05	15.26	39.56	27.08	42.34	2.70		38.57	36.04	161.0	0.20	0.36
C1----------39-45	5.48	4.48	26.25	0.97	0.25	0.07	27.54	32.63	10.24	37.78	---		84.40	72.90	86.5	0.25	0.34
C2----------45-50	7.18	6.30	25.85	0.62	0.15	0.06	26.68	16.60	---	26.68	---		160.72	100	16.5	2.88	0.38
R----------50+																	
Maury silt loam: (72KY-120-1)																	
Ap----------0-8	6.7	5.7	9.38	0.08	0.31	0.15	9.92	13.99					70.9				
B1t----------8-13	7.0	5.8	9.00	0.09	0.18	0.10	9.37	17.28					54.2				
B21t----------13-23	6.4	5.3	10.25	0.12	0.20	0.14	10.71	17.07					62.7				
B22t----------23-32	6.0	5.0	10.25	0.12	0.18	0.17	10.72	19.14					56.0				
B23t----------32-40	5.8	4.7	9.75	0.13	0.20	0.14	10.22	20.28					50.4				
B24t----------40-47	5.5	4.4	9.13	0.12	0.22	0.09	9.56	20.39					46.9				
B25t----------47-54	5.1	4.3	9.50	0.12	0.26	0.10	9.98	21.35					46.7				
B26t----------54-64	5.5	4.2	10.00	0.11	0.27	0.21	10.59	21.96					48.2				
B27t----------64-75	5.4	4.2	11.25	0.12	0.28	0.12	11.77	22.96					51.3				
B28t----------75-91	5.1	4.2	13.25	0.13	0.36	0.12	13.86	23.96					57.8				
B3t----------91-102	4.7	3.8	11.25	0.08	0.26	0.12	11.71	20.35					57.5				

Blank - sample not tested
--- none present

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Ashton	Fine-silty, mixed, mesic Mollic Hapludalfs
Boonesboro	Fine-loamy, mixed, mesic Fluventic Hapludolls
Culleoka	Fine-loamy, mixed, mesic Ultic Hapludalfs
Donerail	Fine, mixed, mesic Typic Argiudolls
Dunning	Fine, mixed, mesic Fluvaquentic Haplaquolls
Eden	Fine, mixed, mesic Typic Hapludalfs
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Elk Variant	Fine-silty, mixed, mesic Typic Paleudalf
Fairmount	Clayey, mixed, mesic Lithic Hapludolls
Faywood	Fine, mixed, mesic Typic Hapludalfs
Huntington	Fine-silty, mixed, mesic Fluventic Hapludolls
Lawrence	Fine-silty, mixed, mesic Aquic Fragiudalfs
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Lowell	Fine, mixed, mesic Typic Hapludalfs
Maury	Fine, mixed, mesic Typic Paleudalfs
McAfee	Fine, mixed, mesic Mollic Hapludalfs
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Newark	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents

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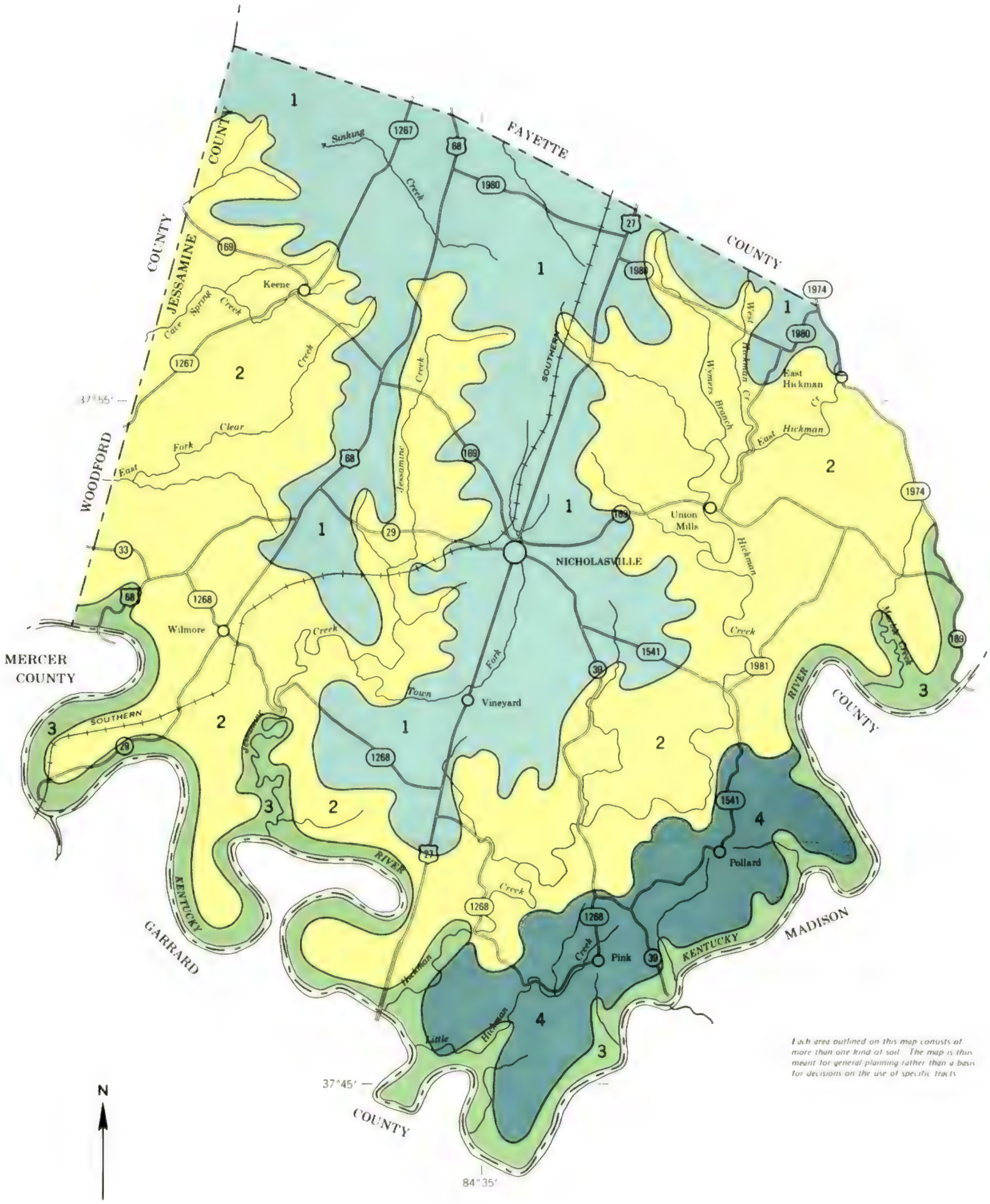


Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND *

- **1** — MAURY-McAFEE: Deep and moderately deep, well drained loamy soils on undulating to rolling uplands
- **2** — McAFEE-MAURY-FAIRMOUNT: Deep to shallow, well drained loamy and clayey soils on rolling to hilly uplands
- **3** — FAIRMOUNT-ROCK OUTCROP: Shallow, well drained clayey soils and limestone outcrop on the Kentucky River bluffs
- **4** — EDEN-CULLEOKA: Moderately deep, well drained, somewhat droughty loamy and clayey soils on hilly to steep uplands

* Terms for texture refer to the surface layer of the major soils

Compiled 1980

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
KENTUCKY AGRICULTURAL EXPERIMENT STATION
KENTUCKY DEPARTMENT FOR NATURAL
RESOURCES AND ENVIRONMENTAL PROTECTION

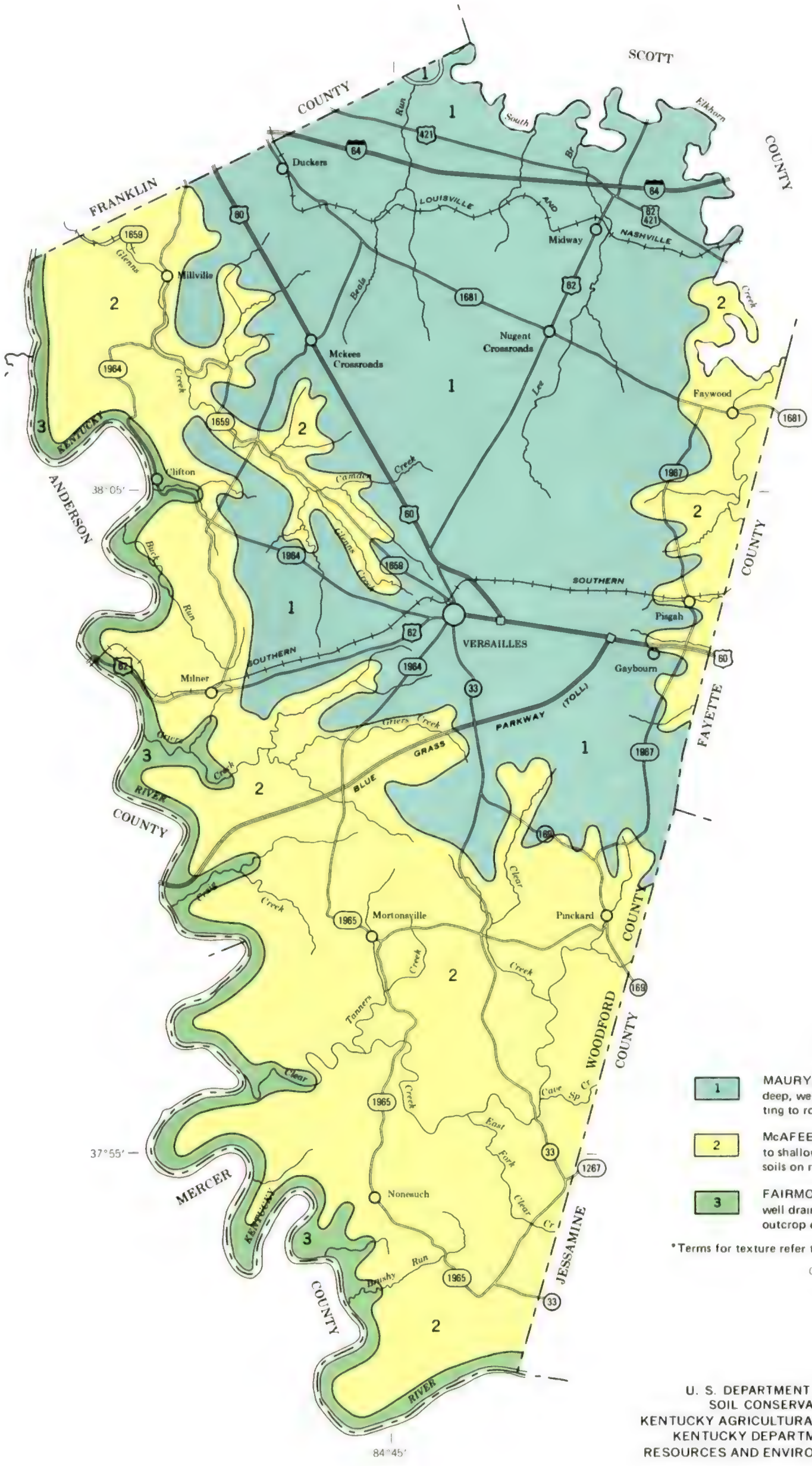
GENERAL SOIL MAP

JESSAMINE COUNTY, KENTUCKY

Scale 1:126,720

1 0 1 2 3 4 Miles

1 0 3 6 Km



LEGEND*

1	MAURY-McAFEE: Deep and moderately deep, well drained loamy soils on undulating to rolling uplands
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*Terms for texture refer to the surface layer of the major soils

Compiled 1980

U. S. DEPARTMENT OF AGRICULTURE
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KENTUCKY AGRICULTURAL EXPERIMENT STATION
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RESOURCES AND ENVIRONMENTAL PROTECTION

GENERAL SOIL MAP

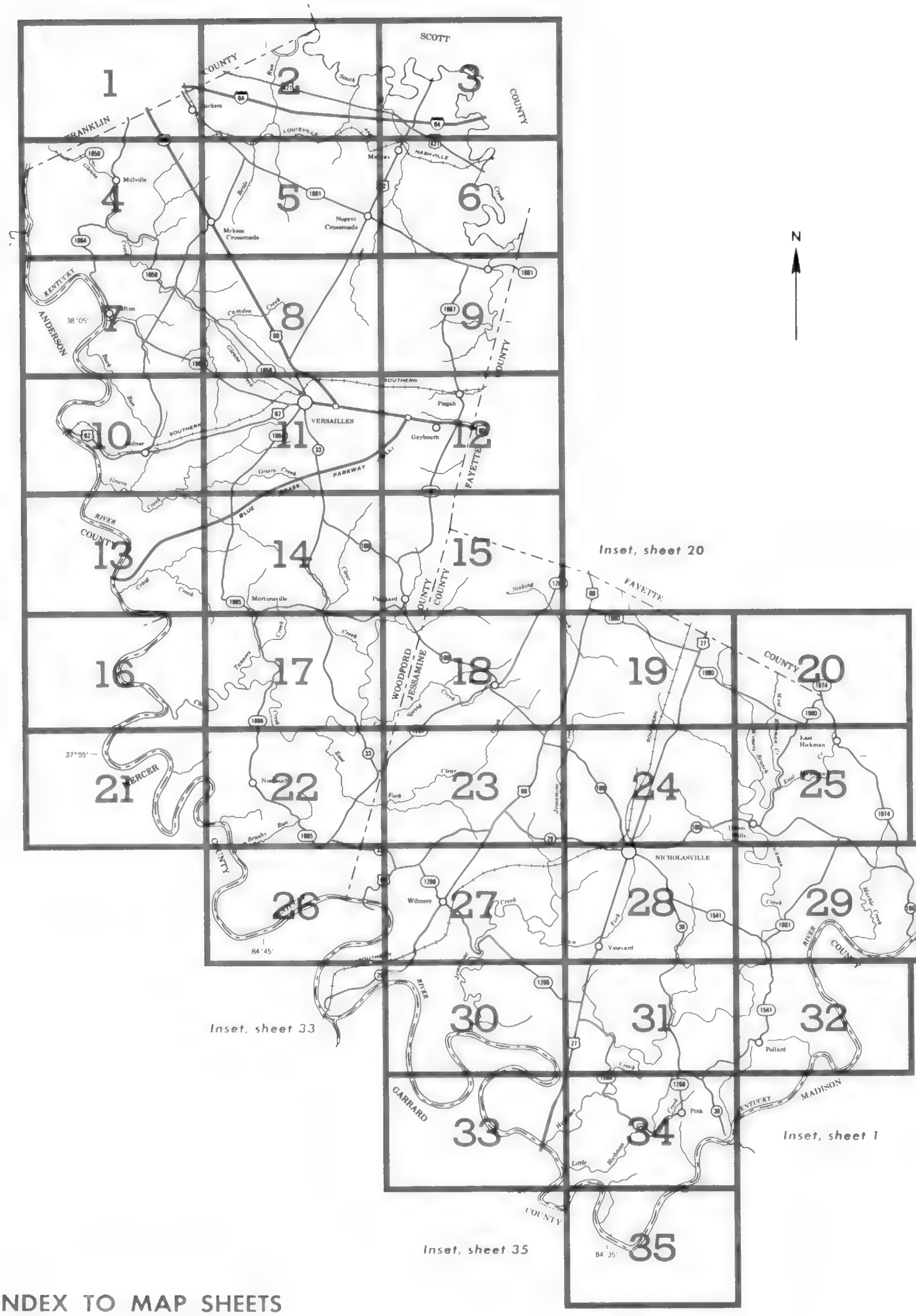
WOODFORD COUNTY, KENTUCKY

Scale 1:126,720

1 0 1 2 3 4 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts



INDEX TO MAP SHEETS

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Original text from each individual map sheet read:
This map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies on 1979 photography obtained from U.S cm Department of Interior, Geological Survey.

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is used to identify separate mapping units that begin with the same first letter. The third letter, a capital A, B, C, D, E, or F is the slope class. Symbols without a slope letter are nearly level soils. A final number, 3, in the symbol shows that the soil is severely eroded.

SYMBOL	NAME
As	Ashton silt loam, 0 to 2 percent slopes
AsB	Ashton silt loam, 2 to 6 percent slopes
Br	Boonesboro silt loam
CuC	Culleoka silt loam, 6 to 12 percent slopes
CuD	Culleoka silt loam, 12 to 20 percent slopes
CuE	Culleoka flaggy silt loam, 20 to 30 percent slopes
DuB	Donerail silt loam, 2 to 6 percent slopes
Du	Dunning silty clay loam
EdC	Eden silty clay loam, 6 to 12 percent slopes
EdD	Eden silty clay loam, 12 to 20 percent slopes
EfE	Eden flaggy silty clay, 20 to 30 percent slopes
EfF	Eden flaggy silty clay, 30 to 50 percent slopes
ElB	Elk silt loam, 2 to 6 percent slopes
ElC	Elk silt loam, 6 to 12 percent slopes
ElD	Elk silt loam, 12 to 20 percent slopes
ErB	Elk Variant silt loam, 2 to 6 percent slopes
FaC	Fairmount flaggy silty clay, 6 to 12 percent slopes
FrE	Fairmount-Rock outcrop complex, 12 to 30 percent slopes
FrF	Fairmount-Rock outcrop complex, 30 to 60 percent slopes
FdB	Faywood silt loam, 2 to 6 percent slopes
FdC	Faywood silt loam, 6 to 12 percent slopes
FdE	Faywood silt loam, 12 to 30 percent slopes
Ht	Huntington silt loam
Lc	Lawrence silt loam
Ld	Lindside silt loam
LoB	Lowell silt loam, 2 to 6 percent slopes
LoC	Lowell silt loam, 6 to 12 percent slopes
MaA	Maury silt loam, 0 to 2 percent slopes
MaB	Maury silt loam, 2 to 6 percent slopes
MaC	Maury silt loam, 6 to 12 percent slopes
MfB	McAfee silt loam, 2 to 6 percent slopes
MfC	McAfee silt loam, 6 to 12 percent slopes
MfD	McAfee silt loam, 12 to 20 percent slopes
MfC3	McAfee silty clay, 6 to 12 percent slopes, severely eroded
MrD	McAfee Rock outcrop complex, 6 to 20 percent slopes
Mv	Melvin silt loam
Ne	Newark silt loam

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline
- AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (21)
- Federal (127)
- State (78)
- County, farm or ranch (1783)

- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPE LINE (normally not shown)
- FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
- Double-line (label) (CANAL)
- Drainage and or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water, W)
- Intermittent (int, I)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS (CnB, WaC2)
- ESCARPMENTS
  - Bedrock (points down slope)
  - Other than bedrock (points down slope)
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION OR SINK
- SOIL SAMPLE SITE (normally not shown) (S)
- MISCELLANEOUS
  - Blowout
  - Clay spot
  - Gravelly spot
  - Gumbo, slick or scabby spot (sodic)
  - Dumps and other similar non soil areas
  - Prominent hill or peak
  - Rock outcrop (includes sandstone and shale)
  - Saline spot
  - Sandy spot
  - Severely eroded spot
  - Slide or slip (tips point upslope)
  - Stony spot, very stony spot

1 825 000 FEET

1 925 000 FEET

(Joins sheet 32)

250 000 FEET

1 050 000 FEET

(Joins sheet 34)

1 100 000 FEET

1 930 000 FEET

MADISON COUNTY

KENTUCKY RIVER

FRANKLIN COUNTY

(Joins sheet 4)

1 845 000 FEET

(Joins sheet 2)

1 240 000 FEET

Hickman Branch

Duckers

1

N

5000 Feet

1 Kilometer

Scale - 1:20000

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 2

(2)

N

1,870,000 FEET

Scale - 1:20000

5000 Feet 0 1 Kilometer

SCOTT COUNTY

FRANKLIN COUNTY

South Elkhorn Creek

Glenn's Creek

Hickman Creek

Ruth Branch

Spring Station

CHESAPEAKE AND OHIO

NASHVILLE

LOUISVILLE

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 5)

1,850,000 FEET

3

N

South Elkhorn Creek

SCOTT COUNTY

SCOTT COUNTY

Lee Branch

MIDWAY

(Joins sheet 2)

(Joins sheet 6)

5,000 Feet 1 Kilometer

Scale - 1:20000

1 0 .5 1

1 000 2 000 3 000 4 000 5 000

1:24 000 FEET

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 4

(4)

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 1)

(Joins sheet 5)

(Joins sheet 7)

1,825,000 FEET

KENTUCKY RIVER

FRANKLIN COUNTY

ANDERSON COUNTY

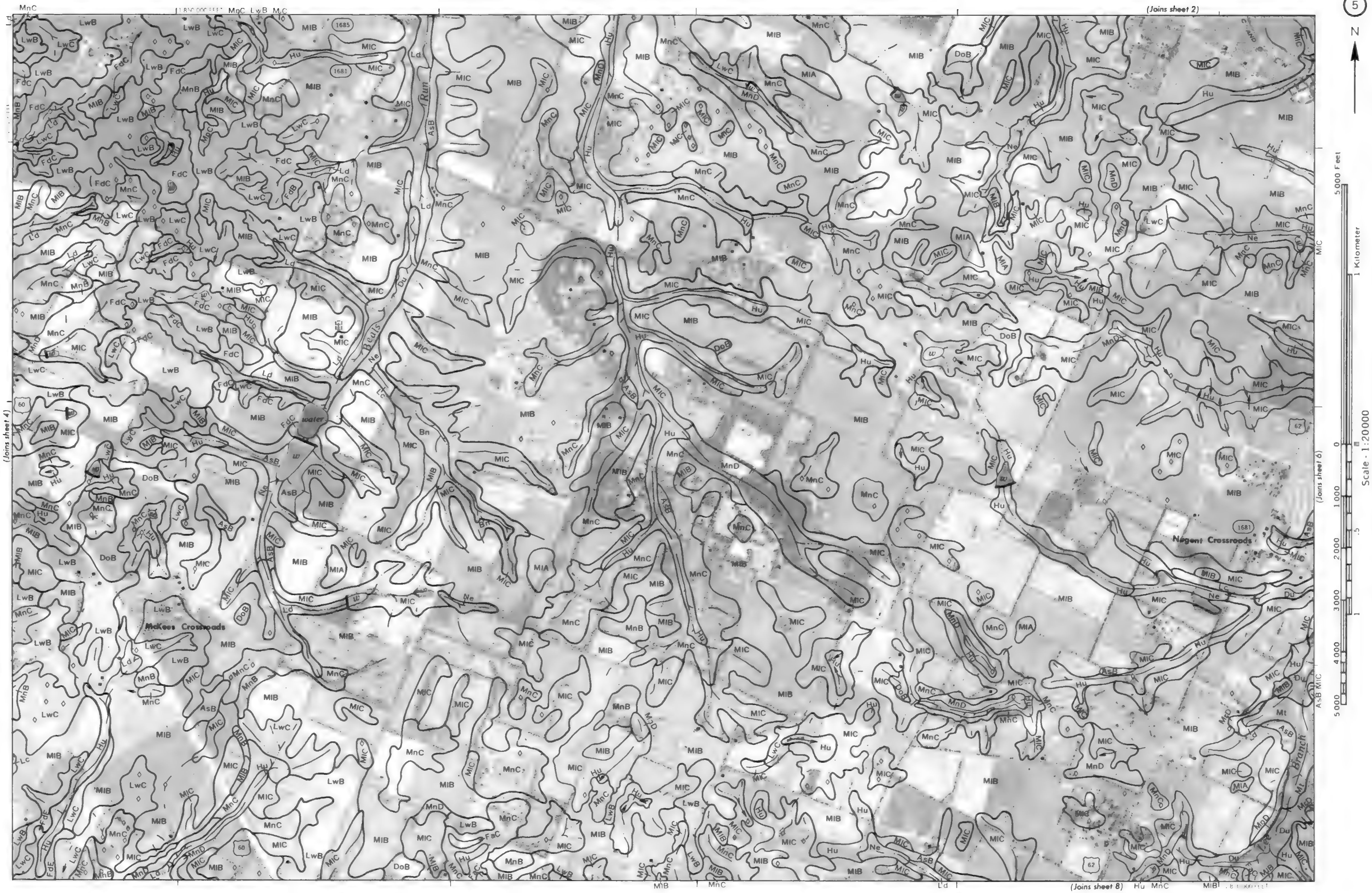
BUCKLEY HILLS WILDLIFE SANCTUARY

Millville

Glenns Creek

Glenns Creek

Glenns Creek


5
N
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 8)
McKees Crossroads
Nugent Crossroads
water
Beals
Run
Branch
5 000 Feet
1 Kilometer
Scale - 1:20000

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 6

6

N

(Joins sheet 3)

1 895 000 FEET

Scale - 1:20000

5 000 Feet 0 1 Kilometer

(Joins sheet 5)

MIDWAY

Wallace

Davistown

South Elkhorn Creek

Town Branch

SCOTT COUNTY

FAYETTE COUNTY

South Elkhorn Cr.

(Joins sheet 9)


RIVER
KENTUCKY
ANDERSON
COUNTY
Clifton
Creek
Run
(Joins sheet 4)
(Joins sheet 8)
(Joins sheet 10)
7
N
5,000 Feet
1 Kilometer
Scale - 1:20000

8

N

Scale - 1:20000

5,000 Feet

1 Kilometer

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 11)

Camden Creek

Glenns Creek

Sportsman Club Lake

water

Jessamine

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 9

9

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 12)

Faywood

FAYETTE COUNTY


10
N
5000 Feet
1 Kilometer
Scale 1:20000
0
1000
2000
3000
4000
5000
(Joins sheet 7)
(Joins sheet 11)
(Joins sheet 13)
KENTUCKY RIVER
Lock Hollow
VERSAILLES FILTRATION PLANT
Matthews Lake
water
ANDERSON COUNTY
Griers Creek
Buck Run

VERSAILLES
(county seat)

Shetland

Hunter Town

SEWAGE DISPOSAL

SOUTHERN PARKWAY

BLUEGRASS

Clunns Creek

Griggt Creek

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 14)

N

Scale - 1:20000

5,000 Feet

1 Kilometer

12

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 11)

(Joins sheet 9)

(Joins sheet 15)

FAYETTE COUNTY

Firearrow

SOUTHERN

Pisgah

Gaybourn

Sycamore Estates

Cooke Lake

Sycamore Lake

PARKWAY

1967

1966

(Joins sheet 10)

(Joins sheet 14)

(Joins sheet 16)

KENTUCKY RIVER

ANDERSON COUNTY

Craig Creek

Grier Creek

FCR TOLL

13

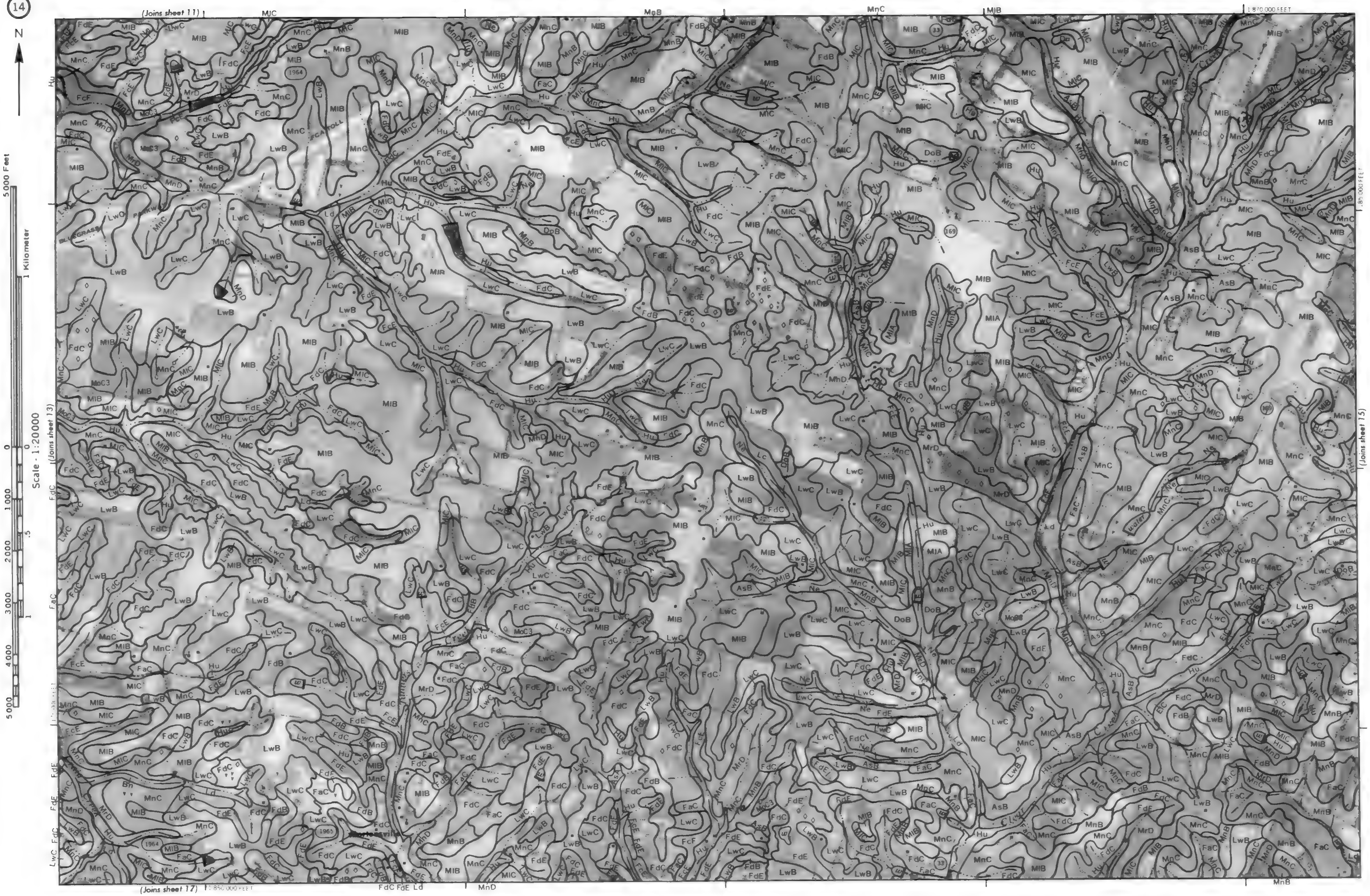
N

Scale - 1:20000

5000 Feet 0 1 Kilometer

5000 4000 3000 2000 1000

1 .5 0


14
N
(Joins sheet 11)
1 870 000 FEET
1 85 000 FEET
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 17)
1 850 000 FEET
5000 Feet
1 Kilometer
Scale - 1:20000
0
1000
2000
3000
4000
5000
.5
1
BLUEGRASS PARKWAY
Nonesuch
Mortonsville

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 15

16

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 13)

ANDERSON COUNTY

KENTUCKY RIVER

MERCER COUNTY

Clear Creek

(Joins sheet 17)

(Joins sheet 21)


17
N
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 22)
1 850 000 FEET
1 870 000 FEET
Clear Creek
Tanners Creek
Spring Creek
5 000 Feet
1 Kilometer
Scale - 1:20000

18

N

Scale - 1:20000

5,000 Feet 0 1 Kilometer

1 .5 0

1000 2000 3000 4000 5000

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 23)

1,895,000 FEET

700,000 FEET

WOODFORD COUNTY

Dixon Town

Keene

Spring Creek

Cane Run Creek

Clear Creek

(Joins inset, sheet 20)

(Joins sheet 18)

(Joins sheet 20)

(Joins sheet 24)

FAYETTE COUNTY

Brannon

Jessamine Creek

Scale - 1:20000

5,000 Feet

1 Kilometer


20
N
5000 Feet
1 Kilometer
Scale 1:20000
0 1000 2000 3000 4000 5000
0 .5 1
1 945 000 FEET
1 910 000 FEET
178 000 FEET
170 000 FEET
173 000 FEET
1 900 000 FEET
1 925 000 FEET
FAYETTE
COUNTY
(Joins sheet 15)
(Joins sheet 19)
(Joins sheet 25)
Hickman Creek
Wilmers Branch
East Hickman Cr
West Hickman
SEWAGE DISPOSAL PONDS
68
1267
1980


KENTUCKY RIVER
MERCER COUNTY
(Joins sheet 16)
(Joins sheet 22)
FcF
FcE
FdE
FdC
FdB
FaC
MnC
MnD
MnB
MrD
MIB
MIC
EvB
ElB
EIC
MoC3
LwB
LwC
Hu
AsB
5000 Feet
1 Kilometer
Scale - 1:20000

22

N

Scale - 1:20000

0 .5 1 Kilometer

0 1000 2000 3000 4000 5000 Feet

(Joins sheet 17)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 26)

KENTUCKY RIVER

MERCER COUNTY

WOODFORD COUNTY

JESSAMINE COUNTY

Nonesuch

Clear Creek

Clear Creek

Fork

Run

Brushy Run

1965

(Joins sheet 18)

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 27)

JESSAMINE COUNTY

WOODFORD COUNTY

Clear Creek

East Fork

23

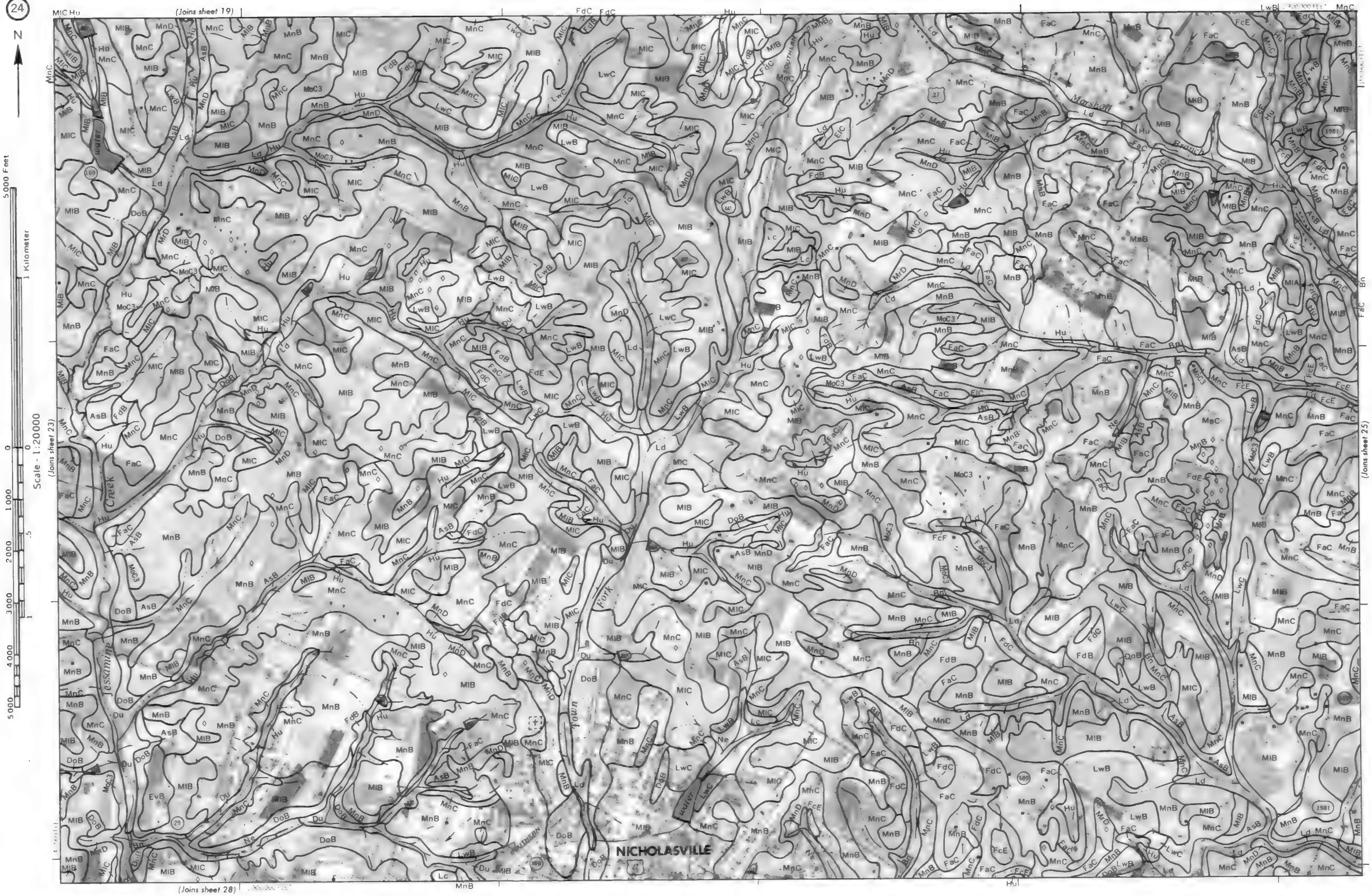
N

5,000 Feet

1 Kilometer

Scale - 1:20000

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 24



JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 25

25

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 20)

(Joins sheet 24)

(Joins sheet 29)

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 26

26

N

5000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 22)

(Joins sheet 27)

(Joins inset, sheet 33)

JESSAMINE COUNTY

WOODFORD COUNTY

MERCER COUNTY

KENTUCKY RIVER

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 27

27

N

Scale - 1:20000

5000 Feet 0 1 Kilometer

1875000 FEET

(Joins sheet 23)

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 30)

KENTUCKY RIVER

GARRARD COUNTY

WILMORE

SEWAGE DISPOSAL

SOUTHERN

Jessamine

Town Fork

Creek

28

N

(Joins sheet 24)

NICHOLASVILLE
(county seat)

FENTRESS SANATORIUM

JESSAMINE CHILDRENS HOME

SEWAGE DISPOSAL

Jessamine

South Fork Town

Town Fork

Vineyard

5000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 31)

1 INCH EQUALS 1,666.667 FEET

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 29

29

N

Scale 1:20000

5,000 Feet

1 Kilometer

(Joins sheet 28)

(Joins sheet 25)

(Joins sheet 32)

Hickman Creek

Logana

Spears

Marble Creek

FAYETTE COUNTY

MADISON COUNTY

KENTUCKY RIVER

YMCA CAMP

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 30

30

N

5,000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 27)

(Joins inset, sheet 33)

(Joins sheet 31)

(Joins sheet 33)

KENTUCKY RIVER

GARRARD COUNTY

Jessamine Creek

Bethel

1268

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 34)

Sulphur Wells (Ambrose)

Hanly

Hickman

Hickman Creek

Black Bridge

GARRARD

31

N

5,000 feet

1 Kilometer

Scale - 1:20000

32

N

Scale - 1:20000

1 Kilometer

5,000 Feet

MADISON COUNTY

KENTUCKY RIVER

Hickman Creek

Mt Lebanon

Pollard

1541

(Joins sheet 29)

(Joins sheet 31)

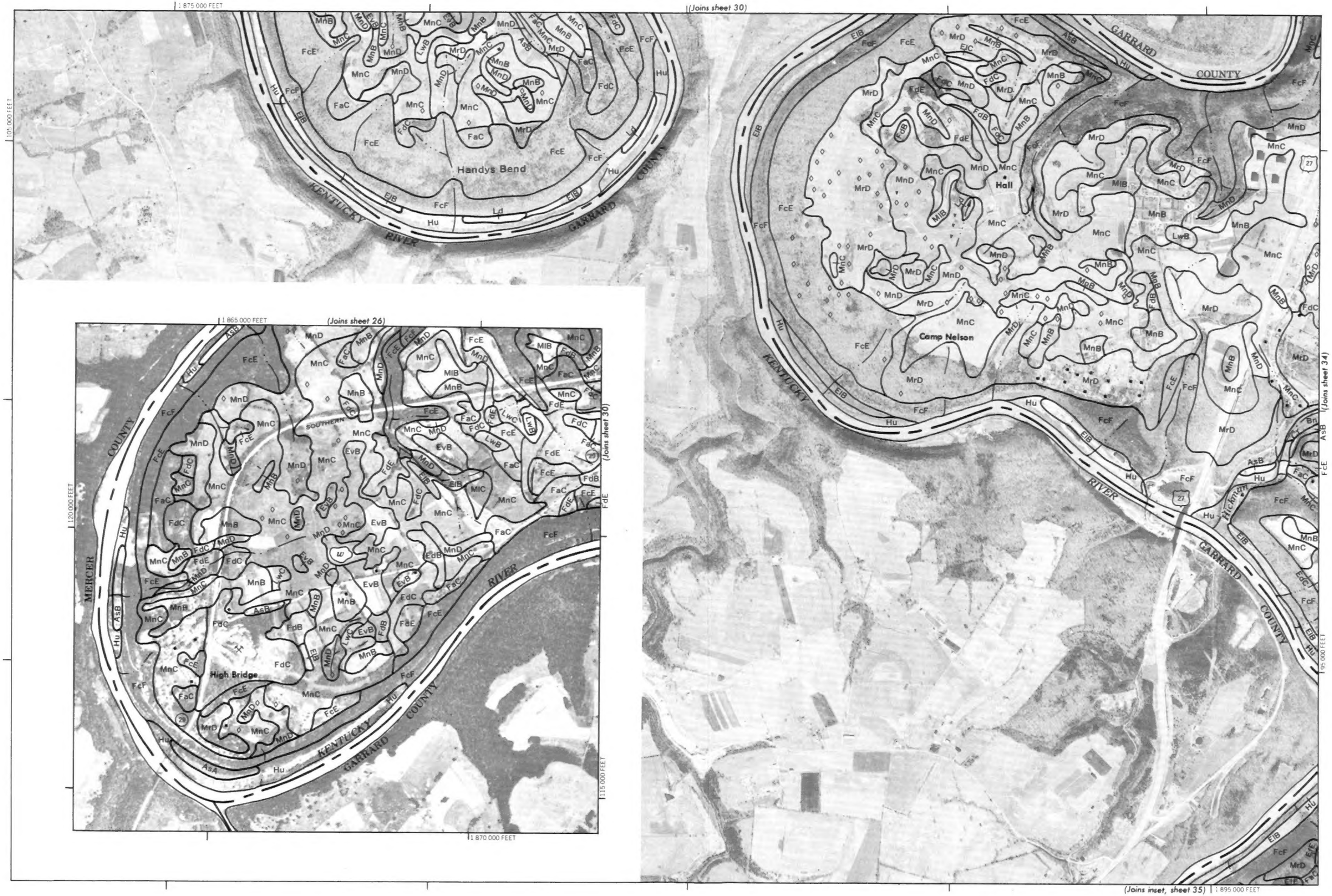
(Joins inset, sheet 1)

1 945 000 FEET

1 925 000 FEET

1 920 000 FEET

1 910 000 FEET


1 875 000 FEET
(Joins sheet 30)
105 000 FEET
Handys Bend
KENTUCKY RIVER
GARRARD COUNTY
Hall
Camp Nelson
1 865 000 FEET
(Joins sheet 26)
(Joins sheet 30)
120 000 FEET
MERCER COUNTY
SOUTHERN
High Bridge
115 000 FEET
1 870 000 FEET
(Joins sheet 34)
95 000 FEET
Hickman
(Joins inset, sheet 35)
1 895 000 FEET
33
N
5000 Feet
1 Kilometer
Scale - 1:20000

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 34

34

N

Scale - 1:20000

5000 Feet

1 Kilometer

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 35)

(Joins inset, sheet 1)

1 920 000 FEET

1 900 000 FEET

105 000 FEET

95 000 FEET

Hickman Creek

Little Hickman Creek

Pink

KENTUCKY RIVER

GARRARD COUNTY

MADISON COUNTY

JESSAMINE AND WOODFORD COUNTIES, KENTUCKY — SHEET NUMBER 35

35

N

1 900 000 FEET

90 000 FEET (Joins inset)

(Joins sheet 34)

GARRARD CO

KY RIVER

COUNTY

KENTUCKY RIVER

GARRARD

Devils Elbow

1 894 000 FEET

(Joins sheet 33)

91 000 FEET

88 000 FEET

1 896 000 FEET

(Joins upper left)

2000 AND 3000-FOOT GRID TICKS

75 000 FEET

1 920 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:20000